The LADIES' *Diary:*
OR
WOMAN'S ALMANACK,

For the Year of our LORD 1790;
Being the second after BISSEXTILE, or LEAP-YEAR.
Containing New Improvements in ARTS and SCIENCES,
And many Entertaining PARTICULARS:
Designed for the *Use* and *Diversion* of the

FAIR-SEX.

The Eighty-seventh ALMANACK Published of this Kind.

VIRTUE and SENSE, with FEMALE-SOFTNESS join'd,
(ALL that subdues and captivates Mankind!)
In BRITAIN'S Matchless FAIR resplendent shine;
THEY rule LOVE's Empire by a Right Divine:
Justly their Charms the astonish'd World admires,
Whom *Royal* CHARLOTTE's bright Example fires.

Y. of Christ.	*Ys. since.*	*Y. of Christ.*	*Ys. since.*
1600 King Charles I. born	190	1714 Q. Ann died, K. Geo.I. succ.	76
1603 Q. Eliz. died, K. Ja. succ.	187	1715 Rebellion in the north -	75
1603 A great Plague in London	187	1716 A very great frost -	74
1605 Popish Gun-powder Plot	185	1726 Sir Isaac Newton died -	64
1616 Shakspeare the poet died	174	1727 K. Geo. I. died, Geo.II.succ.	63
1625 K. James died, Cha. I. succ.	165	1739 War against Spain declared	51
164 Bloody Irish massacre -	149	1739 A very great frost -	51
1642 Sir I. Newton born, Dec. 25	148	1743 A great comet appeared	47
1649 K. Charles I. beheaded	141	1744 War against France declared	46
1658 Oliver Cromwell died -	132	1745 Rebellion in Scotland -	45
1660 K. Charles II. restored	130	1748 A general peace -	42
1662 Royal Society instituted	128	1750 Westminster bridge finished	40
1665 Died of the plague 68,586	125	1752 Date and Calendar altered	38
1666 Great fire in London -	124	1756 War against France declared	34
1666 War against Denmark decl.	124	1760 K. Geo.II. died, G. III.succ.	30
1667 Peace with Hol. Fr. & Den.	123	1762 American philos. soc. instit.	28
1672 War against Holland decl.	118	1762 War against Spain declared	28
1672 Halfpence & Farth. coined	118	1763 Peace with France & Spain	27
1674 Peace with Holland procl.	116	1765 Otaheite discovered -	25
1679 Habeas Corpus act passed	111	1770 Blackfriars bridge finished	20
1685 K.Cha II.died, Ja.II.succ.	105	1772 A revolution in Denmark	18
1688 Prince of Orange landed	102	1772 A revolution in Sweden	18
1688 K. James II. abdicated	102	1775 War against America begun	15
1689 Wm. and Mary crowned	101	1776 America declared independent	14
1693 Hackney coaches established	97	1778 French treaty with America	12
1702 K. Wm. died, Q. Ann succ.	88	1778 War against France begun	12
1702 War against France declared	88	1779 War against Spain begun	11
1707 England & Scotland united	83	1780 War against Holland begun	10
1713 Peace with France procl.	77	1783 A general peace -	7

BIRTH-DAYS, [N.S.] and YEARS, of the ROYAL FAMILY of GREAT BRITAIN.

KING GEORGE III. June 4,	1738	Prince Aug. Fred. Jan. 27,	1773
Prince of Wales, August 12,	1762	Prince Adolph. Fred. Feb. 24,	1774
Prince Frederick, August 16,	1763	Princess Mary, April 25, -	1776
Prince William Henry, Aug. 21,	1765	Princess Sophia, Nov. 3, -	1777
Prs. Charl. Aug. Mat. Sept. 29,	1766	Princess Amelia, Aug. 7, -	1783
Prince Edward, Nov. 2, -	1767	Queen Charlotte, May 19, -	1744
Prs. Augusta Sophia, Nov. 8,	1768	Prs. Augusta of Brunsw. Aug.11,	1737
Prs. Elizabeth, May 22, -	1770	Duke of Gloucester, Nov. 25,	1743
Prince Ernest Augustus, June 5,	1771	Duke of Cumberland, Nov. 7,	1745

YEARS of BIRTHS of the Principal SOVEREIGN PRINCES of EUROPE.

Pius VI. Pope - -	1717	Gustavus, King of Sweden,	1746
Victor Amada Maria. K. Sardinia	1726	William V. Stadtholder, -	1748
Catherine, Empress of Russia,	1729	Charles, IV. King of Spain,	1748
Stanislaus Aug. King of Poland	1732	Christian VII. K. of Denmark,	1749
Maria, Queen of Portugal -	1734	Ferdinand IV. King of Sicily,	1751
Joseph Ben. Aug. Emp. Germ.	1741	Lewis XVI. King of France	1754
Fred. William, King of Prussia,	1744	Selim III. Grand Seignor -	1761

Full Moon,	1st,	0m. paſt	7 morn.
Laſt Quarter,	8th,	6m. paſt	2 morn.
New Moon,	15th,	56m. paſt	7 morn.
Firſt Quarter,	23d,	45m. paſt	10 morn.
Full Moon,	30th,	16m. paſt	7 night.

Sun enters ♒
19d. 6h. 24m.

1	F	Circumciſion	8	4	3	56	22 s 59	☽ riſes		F
2	S			4		56	53	6 a 0		17
3	C	2 Sun. after Chriſtmas		3		57	47	7 17		18
4	M			2		58	41	8 36		19
5	T	Old Chriſtmas Day		2		58	34	9 54		20
6	W	Epiphany: Twelfth-day		1		59	27	11 8		21
7	Th			0	4	0	19	morn		22
8	F	Lucian	7	59		1	11	0 29		23
9	S			58		2	2	1 46		24
10	C	1 Sun. after Epiphany		57		3	21 53	3 0		25
11	M	Plow Mond. O. N. Yr's D.		56		4	44	4 10		26
12	Tu			55		5	34	5 12		27
13	W	Cam. Term beg. Hilary		54		6	24	6 5		28
14	Th	Oxf. Term begins		53		7	13	6 49		29
15	F			52		8	2	☽ ſets		N
16	S			50		10	20 51	5 a 56		1
17	C	2 S. af. Ep. Old Twel. D.		49		11	39	7 3		2
18	M	Q. Char. b. d. k. Priſca		48		12	26	8 7		3
19	Tu			46		14	14	9 12		4
20	W	Fabian. Hil. Ter. 1 return		45		15	1	10 17		5
21	Th	Agnes		44		16	19 47	11 20		6
22	F	Vincent		42		18	34	morn		7
23	S	Hilary Term begins		41		19	19	0 24		8
24	C	3 Sun. after Epiph.		39		21	5	1 26		9
25	M	Converſion of St. Paul		38		22	18 50	2 29		10
26	Tu			36		24	35	3 30		11
27	W	Pr. Aug. F. b. Hil. 2 return		34		26	19	4 26		12
28	Th			33		27	4	5 18		13
29	F			31		29	17 47	6 2		14
30	S	K. Cha. I. mart. 1649		30		30	31	☽ riſes		F
31	C	Septuageſima Sunday		28		32	14	6 a 4		16

Days	L. of D.		Day Inc.	D. breaks		Tw. ends	Sun Eaſt		Cl. bef. S.		7 Stars	So.
1	7 52		0 8	5 59		6 1	4 41		4 15''		8 a	43
6	58		14	57		3	43		6 3			21
11	8 8		24	54		6	46		8 36		7	59
16	20		36	49		11	49		10 24			38
21	32		48	44		16	53		11 55			17
26	48		4	38		22	57		13 7		6	55

Y. of Christ.		Ys. since	Y. of Christ.		Ys. since
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1658	Oliver Cromwell died -	132	1745	Rebellion in Scotland -	45
1660	K. Charles II. restored	130	1748	A general peace -	42
1662	Royal Society instituted	128	1750	Westminster bridge finished	40
1665	Died of the plague 68,586	125	1752	Date and Calendar altered	38
1666	Great fire in London -	124	1756	War against France declared	34
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1702	War against France declared	88	1779	War against Spain begun	11
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1713	Peace with France procl.	77	1783	A general peace -	7

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Prs. Charl. Aug. Mat. Sept. 29, 1766	Princess Amelia, Aug. 7, -	1783
Prince Edward, Nov. 2, - 1767	Queen Charlotte, May 19, -	1744
Prs. Augusta Sophia, Nov. 8, 1768	Prs. Augusta of Brunsw. Aug. 11,	1737
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Stanislaus Aug. King of Poland 1732	Christian VII. K. of Denmark,	1749
Maria, Queen of Portugal - 1734	Ferdinand IV. King of Sicily,	1751
Joseph Ben. Aug. Emp. Germ. 1741	Lewis XVI. King of France	1744
Fred. William, King of Prussia, 1744	Selim III. Grand Seignor -	1761

Full Moon, 1ſt, 0m. paſt 7 morn.	
Laſt Quarter, 8th, 6m. paſt 2 morn.	**Sun enters ♒**
New Moon, 15th, 56m. paſt 7 morn.	**19d. 6h. 24m.**
Firſt Quarter, 23d, 45m. paſt 10 morn.	
Full Moon, 30th, 16m. paſt 7 night.	

1	F	Circumciſion	8	4	3 56	22 59	☽ riſes		F
2	S			4	56	53	6 a 0		17
3	C	2 Sun. after Chriſtmas		3	57	47	7 17		18
4	M			2	58	41	8 36		19
5	Tu	Old Chriſtmas Day		2	58	34	9 54		20
6	W	Epiphany: Twelfth-day		1	59	27	11 8		21
7	Th			0	4 0	19	morn		22
8	F	Lucian	7	59	1	11	0 29		23
9	S			58	2	2	1 46		24
10	C	1 Sun. after Epiphany		57	3	21 53	3 0		25
11	M	Plow Mond. O. N. Yr's D.		56	4	44	4 10		26
12	Tu			55	5	34	5 12		27
13	W	Cam. Term beg. Hilary		54	6	24	6 5		28
14	Th	Oxf. Term begins		53	7	13	6 49		29
15	F			52	8	2	☽ ſets		N
16	S			50	10	20 51	5 a 56		1
17	C	2 S. af. Ep. Old Twel. D.		49	11	39	7 3		2
18	M	Q. Char. b. d. k. Priſca		48	12	26	8 7		3
19	Tu			46	14	14	9 12		4
20	W	Fabian. Hil. Ter. 1 return		45	15	1	10 17		5
21	Th	Agnes		44	16	19 47	11 20		6
22	F	Vincent		42	18	34	morn		7
23	S	Hilary Term begins		41	19	19	0 24		8
24	C	3 Sun. after Epiph.		39	21	5	1 26		9
25	M	Converſion of St. Paul		38	22	18 50	2 29		10
26	Tu			36	24	35	3 30		11
27	W	Pr. Aug. F. b. Hil. 2 return		34	26	19	4 26		12
28	Th			33	27	4	5 18		13
29	F			31	29	17 47	6 2		14
30	S	K. Cha. I. mart. 1649		30	30	31	☽ riſes		F
31	C	Septuageſima Sunday		28	32	14	6 a 4		16

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars So.
1	7 52	0 8	5 59	6 1	4 41	4 15″	8 a 43
6	58	14	57	3	43	6 3	21
11	8 8	24	54	6	46	8 36	7 59
16	20	36	49	11	49	10 24	38
21	32	48	44	16	53	11 55	17
26	48	4	38	22	57	13 7	6 55

Last Quarter, 6th, 0m. past 11 morn.	Sun enters ♓
New Moon, 14th, 9m. bef. 1 morn.	17d. 21h. 14m
First Quarter, 22d, 8m. past 6 morn.	

M D	W D	Sundays, Holydays, &c.	Sun rises		Sun sets		Sun's decl.		☽ rises & sets	
1	M		7	26	4	34	16s	57	7 a	26
2	Tu	Purif. or Candlemas-day		25		35		40	8	48
3	W	*Blase.* Hil. Term 3 return		23		37		22	10	8
4	Th			21		39		4	11	29
5	F	*Agatha*		19		41	15	46	morn	
6	S			18		42		27	0	44
7	C	Sexagesima Sunday		16		44		8	1	56
8	M			14		46	14	49	3	0
9	Tu	Hilary Term 4th return		12		48		30	3	56
10	W			10		50		11	4	43
11	Th			9		51	13	51	5	22
12	F	Hilary Term ends		7		53		31	5	53
13	S	*Old Candlemas day*		5		55		11	6	18
14	C	Quinq. or Sh. Sun. *Valen.*		3		57	12	50	☽ sets	
15	M			1		59		30	6 a	56
16	Tu	Shrove Tuesday	6	59	5	1		9	8	2
17	W	Ash Wednesday		57		3	11	48	9	5
18	Th			55		5		27	10	10
19	F			53		7		5	11	13
20	S			52		8	10	44	morn	
21	C	Quadr. or 1 Sun. in Len		50		10		22	0	14
22	M			48		12		0	1	14
23	Tu			46		14	9	38	2	13
24	W	St. Matthi. Pr. Ad. Fred. b.		44		16		16	3	8
25	Th	[Ember Week		42		18	8	54	3	53
26	F			40		20		31	4	33
27	S			38		22		9	5	9
28	C	2 Sunday in Lent		36		24	7	46	5	39

Days	L. of D.		Day Inc.		D. breaks		Tw. ends		Sun East		Cl. bef. S.		7 Stars S
1	9	8	1	24	5	31	6	29	5	4	14'	7"	6 a 3
6		24		40		23		37		9		33	
11		42		58		15		45		15		40	5
16	10	2	2	18		6		54		20		27	
21		20		36	4	57	7	3		26	13	56	
26		40		56		48		12		32		10	4

Full Moon,	1st,	53m. past	5 morn.		
Last Quarter,	7th,	37m. past	9 even.	**Sun enters ♈**	
New Moon,	15th,	47m. past	6 even.		
First Quarter,	23d,	44m. past	9 even.	**19d. 21h. 38m.**	
Full Moon,	30th,	18m. past	3 aftern.		

M	David		6	34	5	26	7 s 23	☽ rises		F
Tu	Chad			32		28	0	7 a 45		16
W				30		30	6 37	9 7		17
Th				28		32	14	10 27		18
F				26		34	5 51	11 44		19
S				24		36	28	morn		20
C	3 Sun. in Lent	Perpetua		22		38	5	0 52		21
M				20		40	4 41	1 52		22
Tu				18		42	18	2 43		23
W				16		44	3 54	3 24		24
Th				14		46	31	4 0		25
F	Gregory Mart.			12		48	7	4 28		26
S				10		50	2 44	4 54		27
C	4th or Midlent Sunday			8		52	20	5 17		28
M				6		54	1 56	☽ sets		N
Tu				4		56	32	7 a 1		1
W	St. Patrick			2		58	9	8 5		2
Th	Edw. K. of W. Saxons			0	6	0	0 45	9 9		3
F			5	58		2	21	10 12		4
S				56		4	0 n 2	11 12		5
C	5 Sun. in Lent.	Benedict		54		6	26	morn		6
M				52		8	50	0 10		7
Tu				50		10	1 13	1 4		8
W				48		12	37	1 52		9
Th	Annunc. or Lady Day			46		14	2 0	2 34		10
F	Cam. Term ends			44		16	24	3 10		11
S	Oxf. Term ends			42		18	47	3 42		12
C	6 Sun. in L. Palm Sunday			40		20	3 11	4 12		13
M				39		21	34	4 42		14
Tu				37		23	57	☽ rises		F
W				35		25	4 21	8 a 6		16

L. of D.		Day Inc.		D.breaks		Tw. ends		Sun East		Cl. bef. S.		7 Stars So.	
10	52	3	8	4	43	7	17	5	36	12'	36"	4 a	43
11	12		28		32		28		42	11	29		25
	32		48		21		39		48	10	11		7
	52	4	8		11		49		55	8	45	3	48
12	12		28		0	8	0	6	1	7	15		30
	32		48	3	48		12		7	5	42		12

Laſt Quarter, 6th, **3m** paſt **10** morn.	
New Moon, 14th, 29m. paſt **12** noon.	Sun enters ♉
Firſt Quarter, 22d, 4m. paſt **9** morn.	19d. 10h. 23m.
Full Moon, 28th, 55m, paſt **11** night.	

1	Th	*Maunday Thurſday*	5 33	6 27	4 n 44	9 a 26	17
2	F	Good Friday	31	29	5 7	10 41	18
3	S	*Richard Bp. of Chich.*	29	31	30	11 49	19
4	C	Eaſter Day *St. Ambroſe*	27	33	53	morn	20
5	M	Eaſter Monday	25	35	6 15	0 45	21
6	Tu	Eaſter Tueſday	23	37	38	1 30	22
7	W		21	39	7 0	2 8	23
8	Th		19	41	23	2 39	24
9	F		17	43	45	3 4	25
10	S		15	45	8 7	3 28	26
11	C	1 S. af. Eaſt. Low Sun.	13	47	29	3 50	27
12	M		11	49	51	4 11	28
13	Tu		9	51	9 13	4 34	29
14	W	Oxf. and Cam. T. begins	7	53	35	☾ ſets	N
15	Th		5	55	56	8 a 12	1
16	F		4	56	10 17	9 14	
17	S		2	58	38	10 13	
18	C	2 Sunday after Eaſter	0	7 0	59	11 8	
19	M	*Alphege.* Ea. Te. 1 return	4 58	2	11 20	11 57	
20	Tu		56	4	41	morn	
21	W	Eaſter Term begins	54	6	12 1	0 40	
22	Th		52	8	21	1 17	
23	F	St. George.	50	10	41	1 49	
24	S	[Maryb. 1776.	49	11	13 1	2 18	
25	C	3 S. a. Eaſt. St. Mark. Prs.	47	13	20	2 46	
26	M	Eaſter Term 2 return	45	15	40	3 13	
27	Tu		43	17	59	3 44	
28	W		41	19	14 18	☾ riſes	
29	Th		40	20	36	8 a 22	
30	F		38	22	55	9 34	

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars
1	12 54	5 10	3 32	8 28	6 15	3' 51"	2 a 50
6	13 14	30	20	40	21	2 22	32
11	34	50	7	53	27	0 57	13
16	52	6 8	2 53	9 7	33	0 a 21	1 55
21	14 12	28	39	21	39	1 29	36
26	30	46	23	37	44	2 25	17

Last Quarter,	6th,	51m. bef.	1 morn.	
New Moon,	14th,	36m. past	4 morn.	Sun enters ♊
First Quarter,	21st,	46m. past	4 aftern.	20d. 10h. 58m.
Full Moon,	28th,	15m. past	8 morn.	

1	S	St. Philip & James	4	36	7 24	15 ♍ 13	10 a 37	17
2	C	4 Sunday after Easter		34	26	31	11 30	18
3	M	*Inv. of Cross.* Ea. T. 3 re.		33	27	48	morn	19
4	Tu			31	29	16 6	0 11	20
5	W			29	31	23	0 46	21
6	Th	*John Ev. ante Port. Lat.*		27	33	40	1 14	22
7	F			26	34	56	1 37	23
8	S			24	36	17 13	2 1	24
9	C	Rogation Sunday		23	37	29	2 21	25
10	M	Easter Term 4 return		21	39	44	2 43	26
11	Tu			19	41	18 0	3 5	27
12	W	*Old May Day*		18	42	15	3 29	28
13	Th	Ascension or Holy Thur.		16	44	30	3 58	29
14	F	Easter Term 5 return		15	45	44	☽ sets	N
15	S			13	47	59	9 a 6	1
16	C	Sunday after Ascension		12	48	19 12	9 56	2
17	M	Easter Term ends		10	50	26	10 42	3
18	Tu			9	51	39	11 21	4
19	W	Queen Char. born: *Dunstan*		8	52	52	11 54	5
20	Th	Orf. Term ends		6	54	20 5	morn	6
21	F			5	55	17	0 23	7
22	S	Prs. Eliz. born 1770		4	56	29	0 50	8
23	C	Whit Sunday		2	58	40	1 17	9
24	M	Whit Monday		1	59	51	1 44	10
25	Tu	Whit Tuesday	0	8 0	21 2	2 13	11
26	W	Emb. W. *Aug. 1st Abp. C.*	3	59	1	13	2 44	12
27	Th	*Venerable Bede*		58	2	23	3 23	13
28	F			57	3	32	☽ rises	F
29	S	K. Cha. II. Restored 1660		55	5	42	9 a 17	15
30	C	Trinity Sunday		54	6	51	10 4	16
31	M	Trin. Term 1 return		53	7	59	10 43	17

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	14 48	7 4	2 7	9 55	6 50	3′ 9″	0 a 58
6	15 6	22	1 50	10 12	55	40	39
11	22	38	30	32	7 0	57	20
16	36	52	6	57	4	4 0	0
21	50	8 6	0 30	11 40	8	3 48	11 m 41
26	16 2	18	No real Night		12	22	21

Laſt Quarter, 6th, **3m** paſt **10** morn.
New Moon, 14th, 29m. paſt **12** noon.   **Sun enters ♉**
Firſt Quarter, 22d, 4m. paſt **9** morn.   **19d. 10h. 23m.**
Full Moon, 28th, 55m, paſt **11** night.

1	Th	*Maunday Thurſday*	5	33	6	27	4n44	9 a 26	17
2	F	Good Friday		31		29	5 7	10 41	18
3	S	*Richard Bp. of Chich.*		29		31	30	11 49	19
4	C	Eaſter Day *St. Ambroſe*		27		33	53	morn	20
5	M	Eaſter Monday		25		35	6 15	0 45	21
6	Tu	Eaſter Tueſday		23		37	38	1 30	22
7	W			21		39	7 0	2 8	23
8	Th			19		41	23	2 39	24
9	F			17		43	45	3 4	25
10	S			15		45	8 7	3 28	26
11	C	1 S. af. Eaſt. Low Sun.		13		47	29	3 50	27
12	M			11		49	51	4 11	28
13	Tu			9		51	9 13	4 34	29
14	W	Orf. and Cam. T. begins		7		53	35	☽ ſets	N
15	Th			5		55	56	8 a 12	
16	F			4		56	10 17	9 14	
17	S			2		58	38	10 13	
18	C	2 Sunday after Eaſter		0	7	0	59	11 8	
19	M	*Alphege.* Ea. Te. 1 return	4	58		2	11 20	11 57	
20	Tu			56		4	41	morn	
21	W	Eaſter Term begins		54		6	12 1	0 40	
22	Th			52		8	21	1 17	
23	F	St. George.		50		10	41	1 49	
24	S	[Maryb. 1776.		49		11	13 1	2 18	
25	C	3 S. a. Eaſt. St. Mark. Prs.		47		13	20	2 46	
26	M	Eaſter Term 2 return		45		15	40	3 13	
27	Tu			43		17	59	3 44	
28	W			41		19	14 18	☽ riſes	F
29	Th			40		20	36	8 a 22	
30	F			38		22	55	9 34	

Days	L. of D.		Day Inc.		D. breaks		Tw. ends		Sun Eaſt		Cl. bef. S.		7 Stars S
1	12	54	5	10	3	32	8	28	6	15	3′	51″	2 a 50
6	13	14		30		20		40		21	2	22	32
11		34		50		7		53		27	0	57	13
16		52	6	8	2	53	9	7		33	0 a 21	1	55
21	14	12		28		39		21		39	1	29	36
26		30		46		23		37		44	2	25	17

Laſt Quarter,	6th, 51m. bef. 1 morn.	
New Moon,	14th, 36m. paſt 4 morn.	Sun enters ♊
Firſt Quarter,	21ſt, 46m. paſt 4 aftern.	20d. 10h. 58m.
Full Moon,	28th, 15m. paſt 8 morn.	

1	S	St. Philip & James	4 36	7 24	15 n 13	10 a 37	17
2	C	4 Sunday after Eaſter	34	26	31	11 30	18
3	M	Inv. of Croſs. Ea. T. 3 re.	33	27	48	morn	19
4	Tu		31	29	16 6	0 11	20
5	W		29	31	23	0 46	21
6	Th	John Ev. ante Port. Lat.	27	33	40	1 14	22
7	F		26	34	56	1 37	23
8	S		24	36	17 13	2 1	24
9	C	Rogation Sunday	23	37	29	2 21	25
10	M	Eaſter Term 4 return	21	39	44	2 43	26
11	Tu		19	41	18 0	3 5	27
12	W	Old May Day	18	42	15	3 29	28
13	Th	Aſcenſion or Holy Thurſ.	16	44	30	3 58	29
14	F	Eaſter Term 5 return	15	45	44	☽ ſets	N
15	S		13	47	59	9 a 6	1
16	C	Sunday after Aſcenſion	12	48	19 12	9 56	2
17	M	Eaſter Term ends	10	50	26	10 42	3
18	Tu		9	51	39	11 21	4
19	W	Queen Char. born: Dunſtan	8	52	52	11 54	5
20	Th	Orſ. Term ends	6	54	20 5	morn	6
21	F		5	55	17	0 23	7
22	S	Prs. Eliz. born 1770	4	56	29	0 50	8
23	C	Whit Sunday	2	58	40	1 17	9
24	M	Whit Monday	1	59	51	1 44	10
25	Tu	Whit Tueſday	0	8 0	21 2	2 13	11
26	W	Emb. W. Aug. 1ſt Abp. C.	3 59	1	13	2 44	12
27	Th	Venerable Bede	58	2	23	3 23	13
28	F		57	3	32	☽ riſes	F
29	S	K. Cha. II. Reſtored 1660	55	5	42	9 a 17	15
30	C	Trinity Sunday	54	6	51	10 4	16
31	M	Trin. Term 1 return	53	7	59	10 43	17

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Eaſt	Cl. aft. S.	7 Stars So.
1	14 48	7 4	2 7	9 55	6 50	3′ 9″	0 a 58
6	15 6	22	1 50	10 12	55	40	39
11	22	38	30	32	7 0	57	20
16	36	52	6	57	4	4 0	0
21	50	8 6	0 30	11 40	8	3 48	11 m 41
26	16 2	18	No real Night		12	22	21

Laſt Quarter,	4th,	50m. paſt	3 aftern.	
New Moon,	12th,	10m. paſt	6 even.	Sun enters ♋
Firſt Quarter,	19th,	5m. paſt	10 night.	20d. 19h. 40m.
Full Moon,	26th,	58m. paſt	4 aftern.	

1	Tu	*Nicomede*	3	52	8	8	22n 8	11 a 13	18
2	W	☉ rſ. Term begins		52	8		15	11 39	19
3	Th	Corpus Chriſti [Ter. b.		51	9		23	morn	20
4	F	K. Geo. III. b. 1738. Tr.		50	10		30	0 3	21
5	S	Pr. Er. Aug. b. 1771. *Bonif.*		49	11		36	0 24	22
6	C	1 Sunday after Trinity		48	12		43	0 45	23
7	M	Trin. Term. 2 return		48	12		49	1 8	24
8	Tu			47	13		54	1 31	25
9	W			46	14		59	1 56	26
10	Th			46	14	23	4	2 27	27
11	F	St. Barnabas.		45	15		8	3 3	28
12	S			45	15		12	☽ ſets	N
13	C	2 Sun. after Trin.		44	16		15	8 a 37	
14	M	Trin. Term 3 return		44	16		18	9 19	2
15	Tu			44	16		21	9 54	3
16	W			44	16		23	10 25	4
17	Th	*St. Alban*		43	17		25	10 53	5
18	F						26	11 18	6
19	S						27	11 43	7
20	C	3 S. a. T. *Tr. Ed. K.W.S.*					28	morn	8
21	M	Trin. T. 4 ret. Long. Day					28	0 9	9
22	Tu						28	0 39	10
23	W	Trinity Term ends					27	1 14	11
24	Th	Nativ. of St. J. Bapt. Midſ.					26	1 54	12
25	F			43			24	2 43	13
26	S			44	17		22	☽ riſes	F
27	M	4 Sunday after Trinity		44	16		20	8 a 33	15
28				44	16		17	9 8	16
29	T	St. Peter		45	16		14	9 36	17
30	W			45	15		11	9 59	18

Longeſt Day at Lond. is 16h. 34m. 4ſec.

allowing 9m. 16ſec. for refraction.

Days	L. of D.		Day Inc.		D.breaks	Tw. ends	Sun Eaſt	Cl. aft. S.		7 Stars S.	
1	16	16	8	32			7 16	2′ 36″		10 m 56	
6		24		40	No night, but		18	1 46			36
11		30		46	conſtant day		19	0 49			16
16		32		48	or twilight.		20	0 b 13		9 55	
21		34		50			20	1 17			34
26		32	odec.	2			20	2 22			14

Laſt Quarter,	4th, 45m. paſt	8 morn.
New Moon,	12th, 17m. paſt	5 morn.
Firſt Quarter,	19th, 35m. paſt	2 morn.
Full Moon,	26th, 5m. paſt	3 morn.

Sun enters ♌
22d. 6h. 30m.

1	Th		3 46	3 14	23 n 7	10 a 22	19
2	F	*Viſitation of Virgin Mary*	46	14	2	10 43	20
3	S	Dog Days begin	47	13	22 57	11 5	21
4	C	5 S. aft. Tr. *Tran.St.Mar.*	47	13	52	11 29	22
5	M	*Old Midſummer day*	48	12	47	11 53	23
6	Tu	Camb. Commencement	49	11	41	morn	24
7	W	*Thomas a Becket.*	49	11	34	0 22	25
8	Th		50	10	28	0 56	26
9	F	**Camb. Term ends**	51	9	20	1 36	27
10	S		52	8	13	2 24	28
11	C	**6 Sun. after Trin.**	53	7	5	3 21	29
12	M	**Orford Act**	54	6	21 57	D ſets	N
13	Tu		55	5	48	8 a 23	1
14	W		56	4	39	8 51	2
15	Th	*Swithin*	57	3	30	9 19	3
16	F		58	2	20	9 45	4
17	S	**Orf. Term ends**	59	1	10	10 11	5
18	C	7 Sun. aft. Trinity	4 0	0	20 59	10 39	6
19	M		1	7 59	48	11 11	7
20	Tu	*Margaret*	3	57	37	11 49	8
21	W		4	56	25	morn	9
22	Th	*Magdalen*	5	55	14	0 33	10
23	F		7	53	1	1 26	11
24	S		8	52	19 40	2 26	12
25	C	8 S. aft. Trin. St. James	9	51	36	3 32	13
26	M	*St. Anne Mo. of the V. M.*	11	49	23	D riſes	F
27	Tu		12	48	9	8 a 0	15
28	W		14	46	18 55	8 25	16
29	Th		15	45	41	8 47	17
30	F		17	43	27	9 9	18
31	S		18	42	12	9 31	19

Days	L. of D.	Day dec.	D breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars So.
1	16 28	0 6			7 19	3' 23"	8 m 53
6	22	12			18	4 17	33
11	14	20	No real Night		16	5 1	12
16	4	30			13	35	7 52
21	15 52	42			9	56	32
26	38	56	0 48	11 3	5	6 4	12

Laſt Quarter,	3d,	19m. paſt	2 morn.	
New Moon,	10th,	44m. paſt	2 aftern.	Sun enters ♍
Firſt Quarter,	17th,	45m. paſt	7 morn.	22d. 12h. 50m.
Full Moon,	24th,	36m. paſt	3 aftern.	

1	C	9 S. af. Tri. Lammas Day	4	20	7	40	17 n 57	9 a 54	20
2	M			21		39	41	10 21	21
3	Tu			23		37	26	10 52	22
4	W			24		36	10	11 32	23
5	Th			26		34	16 54	morn	24
6	F	Transfiguration		28		32	37	0 15	25
7	S	Prs. Ame. b. Na. of Jeſus		29		31	20	1 6	26
8	C	10 Sunday after Trinity		31		29	3	2 8	27
9	M			33		27	15 46	3 15	28
10	Tu	St. Laurence		35		25	28	D ſets	N
11	W	Prs. Brunſ. b. Dog D. e.		36		24	11	7 a 22	1
12	Th	Pr. Wales b. O. Lam. day		38		22	14 53	7 47	2
13	F			40		20	34	8 17	3
14	S			42		18	16	8 46	4
15	C	11 S. aft. Trin. Aſſumption		43		17	13 57	9 17	5
16	M	Duke of York born 1763		45		15	38	9 53	6
17	Tu			47		13	19	10 35	7
18	W			49		11	12 59	11 26	8
19	Th			50		10	40	morn	9
20	F			52		8	20	0 22	10
21	S	Duke of Clarence b. 1765		54		6	0	1 24	11
22	C	12 Sunday after Trinity		56		4	11 40	2 29	12
23	M			58		2	20	3 39	13
24	Tu	St. Bartholomew	5	0		0	10 59	D riſes	F
25	W			2	6	58	38	6 a 56	15
26	Th			3		57	17	7 17	16
27	F			5		55	9 56	7 39	17
28	S	St. Auguſtin		7		53	35	8 4	18
29	C	13 S. af. Tri. Beh. J. Bap.		9		51	14	9 31	19
30	M			11		49	8 52	9 59	20
31	Tu			13		47	31	10 33	21

Days	L. of D.		Day dec.		D. breaks		Tw. ends		Sun Eaſt		Cl. bef. S.		7 Stars So.	
1	15	20	1	14	1	23	10	36	7	0	5′	54″	6 m	48
6		4		30		43		15	6	55		28		29
11	14	48		46	2	1	9	57		50	4	47		10
16		30	2	4		19		40		45	3	52	5	51
21		12		22		34		25		39	2	46		32
26	13	54		40		49		10		34	1	28		14

Last Quarter,	1st, 34m. past 7 even.	
New Moon,	8th, 34m. past 11 night	Sun enters ♎
First Quarter,	15th, 54m past 2 aftern.	22d 9h. 17m.
Full Moon,	3d m. past 7 morn	

Day		Event								
1	W	Giles Ab. a. a C.	5	15	6	4	8 9	11 a 14	22	
2	Th	London burnt 1666		17	4		7 47	morn	23	
3	F			19	4		25	0 3	24	
4	S			21	3		3	0 58	25	
5	C	14 Sunday after Trinity		2	37	6 40	2 3	26	
6	M			24	36		18	3 12	27	
7	Tu	Eunurchus		26	34	5 55	4 28	28	
8	W	Nativity of the B. V. Mary		28	32	33	☽ sets	N	
9	Th			30	30	10	6 a 23	1	
10	F			32	28	4 47	6 55	2	
11	S			34	26	24	7 26	3	
12	C	15 Sunday after Trinity		36	24	2	8 2	4	
13	M			3	22	3 38	8 43	5	
14	Tu	Holy-Cross		40	20	15	9 32	6	
15	W	Ember Week		42	18	2 52	10 26	7	
16	Th			44	16	2	11 28	8	
17	F	Lambert		46	14	6	morn	9	
18	S			48	12	1 4	0 34	10	
19	C	16 Sunday after Trinity		50	10	19	1 70	11	
20	M			52	8	0 56	2 48	12	
21	Tu	St. Matthew		54	6	32	3 54	13	
22	W	K. Geo. III. crown. 1761		56	4	9	4 59	14	
23	Th			58	2	os 14	☽ rises	F	
24	F		6	0	0	38	6 a 18	16	
25	S			2	5 58	1 1	6 42	17	
26	C	17 S. af. Tri. St. Cyprian		3	57	25	7 10	18	
27	M			5	55	48	7 44	19	
28	Tu				53	2 11	8 22	20	
29	W	St. Mich. Prs. Ch. A. M. b.			51	35	9 5	21	
30	Th	St. Jerom C. D.		11	49	58	9 58	22	

Days	L. of D.	Day dec.	D. breaks	tw. ends	Sun ri.	Cl. aft. S.	7 Stars So.
1	13 30	3 4	3 6	8 53	6 27	0' 19''	4 m 52
6	12	22	20	39	21	1 56	34
11	12 52	42	33	25	14	3 38	16
16	32	4 2	44	15	8	5 23	3 58
21	12	22	55	4	2	7 7	41
26	11 54	49	4 6	7 52	5 56	8 49	23

Last Quarter, 1st, 32m. past 11 morn.	
New Moon, 8th, 36m. past 8 morn.	Sun enters ♏
First Quarter 15th, 5m. past 1 morn.	22d. 17h. 13m.
Full Moon, 23d, 7m. bef. 1 morn.	
Last Quarter, 31st, 28m. past 1 morn.	

1	F	Remigius	6 13	5 47	38 22	10 a 55	23
2	S		15	45	45	morn	24
3	C	18 Sunday after Trin.	17	43	4 8	0 1	25
4	M		19	41	31	1 12	26
5	Tu		21	39	55	2 27	27
6	W	Faith	23	37	5 18	3 45	28
7	Th		25	35	41	5 7	29
8	F		27	33	6 4	D sets	N
9	S	St. Denys	29	31	27	6 a 6	1
10	C	19 S. af. Tr. O. Mic. D.	31	29	49	6 45	2
11	M	Oxf. and Ca. T. begin	33	27	7 12	7 33	3
12	Tu		35	25	35	8 26	4
13	W	Transf. of K. Edw. Conf.	37	23	57	9 28	5
14	Th		39	21	8 20	10 33	6
15	F		41	19	42	11 40	7
16	S		43	17	9 4	morn	8
17	C	20 S. aft. Trin. Etheldrea	44	16	26	0 49	9
18	M	St. Luke	46	14	48	1 55	10
19	Tu		48	12	10 10	3 0	11
20	W		50	10	31	4 4	12
21	Th		52	8	53	5 8	13
22	F		54	6	11 14	6 12	14
23	S		56	4	35	D rises	F
24	C	21 Sunday after Trinity	58	2	56	5 a 52	16
25	M	K. Geo. III. Accef. Crisp 7	0	0	12 17	6 27	17
26	Tu	K. Geo. III. Procl. 1760	2 4	58	37	7 9	18
27	W		3	58	58	7 56	19
28	Th	St. Simon and Jude	5	57	13 18	8 52	20
29	F		7	55	38	9 53	21
30	S		9	51	57	10 59	22
31	C	22 Sunday after Trinity	11	4	14 1	morn	23

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	11 34	5 0	4 18	7 42	5 50	10' 27"	3 m 5
6	14	20	29	31	44	11 57	2 47
11	10 54	40	39	21	37	13 18	28
16	34	6 0	49	11	31	14 26	9
21	16	18	58	1	25	15 18	1 51
26	9 56	38	5 7	6 52	19	54	30

New Moon,	6th,	21m. past	6 even.	Sun enters ♐
First Quarter,	13th,	2m. past	3 aftern.	21d. 13h. 28m.
Full Moon,	21st,	43m. past	7 even.	
Last Quarter,	29th,	11m. past	1 aftern.	

1	M	All Saints	7 13	4 47	14s 36	0 m 10	24
2	Tu	Prince Edward b. *All Souls*	14	40	55	1 23	25
3	W	Prs. Soph. b. Mic. T. 1 ret.	16	44	15 14	2 42	26
4	Th		18	42	33	4 1	27
5	F	Powder Plot, 1605	20	40	51	5 23	28
6	S	*Leonard,* Mich. Ter. beg.	21	39	16 9	☽ sets	N
7	C	23 S. af. Tr. D. of Cum. b.	23	37	27	5 a 22	1
8	M	Prs. Aug. Sophia b. 1768	25	35	44	6 15	2
9	Tu	Ld. Mayor's Day at Lond.	26	34	17 1	7 14	3
10	W		28	32	18	8 19	4
11	Th	*St. Martin*	30	30	35	9 28	5
12	F	Mich. Term 2 return	32	28	51	10 37	6
13	S	*Britius*	33	27	18 7	11 43	7
14	C	24 Sunday after Trinity	35	25	23	morn	8
15	M	*Machutus*	36	24	38	0 49	9
16	Tu		38	22	53	1 55	10
17	W	*Hugh Bp. of Lincoln*	39	21	19 8	2 5	11
18	Th	Mich. Term 3 return	41	19	22	4 1	12
19	F		42	18	36	5 3	13
20	S	*Edmund K. and M.*	44	16	50	6 6	14
21	C	25 Sunday after Trinity	45	15	20 3	☽ rises	F
22	M	*Cæcilia.* Old Mart. day	46	14	16	5 a 5	16
23	Tu	*St. Clement*	48	12	28	5 51	17
24	W		49	11	41	6 43	18
25	Th	D. Glou. b. *Catharine.* Mi.	50	10	52	7 43	19
26	F	[Term 4 re.	52	8	21 4	8 4	20
27	S	Advent Sunday	53	7	1	9 55	21
28	C		54	6	25	11 4	22
29	M	Mich. Term ends	5	5	35	morn	23
30	Tu	St. Andrew	56	4	45	0 17	24

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	9 34	7 0	5 17	6 43	5 13	16 13″	1 m 9
6	18	16	23	37	7	8	0 49
11	0	34	30	30	2	15 41	29
16	8 44	50	36	24	4 57	14 53	8
21	30	8 4	42	18	53	13 44	11 a 43
26	16	18	48	12	49	12 15	22

New Moon,	6 h, 5m. aft	4 morn.
First Quarter,	1th, 50m. paſt	8 morn
Full Moon,	21ſt, 4 m paſt	1 afte n.
Laſt Quarter,	28th, 54 aſt	10 night.

Sun enters ♑
21d. 1h. 52m.

1	W		7	57	4	3	21 S 54	1 m 34	25
2	Th			5		2	22 3	2 30	26
3	F			9		1	12	4 10	27
4	S		8	0		0	20	30	28
5	C	2 Sun. in Advent.			1	3 59	28	6 4	29
6	M	*Nicholas*			2	58	35	D ſets	N
7	Tu				3	57	42	5 48	1
8	W	*Conception of V. Mary*			3	57	48	6 58	2
9	Th				4	56	54	8 8	3
10	F				4	56	59	9 17	4
11	S				5	55	23 4	10 26	5
12	C	3 Sunday in Advent.			6	54	8	11 34	6
13	M	*Lucy*			6	54	12	morn	7
14	Tu				6	54	16	0 3	8
15	W	Ember Week			7	53	19	1 4	9
16	Th	O. ʃapi. **Cam. T. ends**			7	53	22	2 42	10
17	F	**Oxf. Term ends**			7	53	24	3 45	11
18	S							26	4 45	12
19	C	4 Sunday in Advent						27	5 45	13
20	M							28	6 38	14
21	Tu	St. Thomas. **Shorteſt Day**						28	D riſes	F
22	W							28	5 a 24	16
23	Th							27	6 25	17
24	F			8			52	26	7 31	18
25	S	Chriſtmas Day		7			53	24	8 42	19
26	C	1 S. aft. Chriſt. St.Stephen		7			53	22	9 54	20
27	M	St. John		7			53	20	11 7	21
28	Tu	Holy Innocents		6			54	17	morn	22
29	W			6			4	13	0 21	23
30	Th			6			54	9	1 37	24
31	F	*Silveſter*		5			55	5	2 53	25

Shorteſt Day at Lond. is 7h. 44m. riʃt. allowing 9m. 5ſ for refraction.

Day	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Faſt	Cl. aft. S.	7 Stars So.
1	8 6	8 28	5 54	6 6	4 46	10′ 28″	11 a 1
6	7 56	38	57	3	43	8 26	10 39
11	50	44	59	1	41	6 11	17
16	46	48	6 0	0	40	3 47	9 55
21	44	50	1	5 59	40	1 17	33
26	46	oinc. z	0	6 0	40	1b. 13	11

CHRONOLOGICAL NOTES, &c. in 1790.

Dominical Letter	C	Roman Indiction	8	Easter Day	April	4
Golden Number	5	Septuage. Sun.	Jan. 31	Ascension Day	May	13
Epact	- 14	Shrove Sunday	Feb. 14	Whit-Sunday	May	23
Cycle of the Sun	7	Lent begins	Feb. 17	Advent-Sun.	Nov.	28

ECLIPSES, &c.

THERE will be six eclipses this year; four of the Sun, and two of the Moon.—I. The Sun is eclipsed April 14, invisible. The conjunction at 29m. afternoon.—II. The Moon is eclipsed April 28, visible and total. Beginning of eclipse 10h. 10m. at night; beginning of total darkness 11h. 8m.; middle of the eclipse 11h. 56m.; end of total darkness 0h. 45m. in the morning of April 29; and end of the eclipse 1h. 43m. morn. digits eclipsed 20° 1′ from south side of the earth's shadow.—III. The Sun is eclipsed May 14, invisible. Conjunction at 4h. 36m. morning.—IV. The Sun is eclipsed October 8, invisible. Conjunction at 8h. 36m. morning.—V. The Moon is eclipsed October 22, visible, and total. Beginning of the eclipse 10h. 56m. at night; beginning of total darkness 0h. 3m. morning of Oct. 23; middle at 0h. 54m.; end of total dark. 1h. 46m.; and end of the eclipse 2h. 52m. digits eclipsed 18° 56′ from north side of the earth's shadow.—VI. The Sun eclipsed November 6, invisible, at 6h. 21m. afternoon.——*And for further particulars, with types &c. of the eclipses, see the Diary Supplement.*

VENUS is an evening star till March 18; then a morning star to the end.

JUPITER is a morning star till Feb. 14, then an evening star till Sept. 3; and lastly a morning star for the rest of the year.

ANSWERS to the ENIGMAS.

1 Bell	4 Letter *R*	7 Curtain	10 Pincushion
2 Shadow	5 Key	8 Ear	11 Smile
3 Shuttlecock	6 Umbrella	9 Nose	12 *or Prize*, Time.

Answers *to the* Prize Enigma.

1 *Mrs.* M. H's *Congratulation to our ingenious Correspondents Mr.* Robert Richardson *and Miss* Betty Smales *(now Mrs.* Richardson) *on their late auspicious Marriage.*

Ah happy Richardson! may kindest fate decree
A long, long life of bliss for Smales and thee!
" O bliss sincere! if bliss sincere can be,
" In the dull sphere of dark mortality;
" When sense and soul conspire to feel a flame
" That burns thro' age, unchangeably the same;
" Nor *Time*, whose envious rage would all remove,
" Can clip the wings of chaste connubial love!"
Old Di salute thee with a parent's joy,
And hopes your muses now will not turn coy.

2. Stre-

2. Strephon's *Address to Miss* Alexia Corney.

Excited by thy soften'd strain,
My heart inhales a wayward pain,
  That *Time* does nought remove;

But still pant for poetic fame,
And oft in secret sigh thy name;
  Ah me! too-like 'tis love.

If so, shall I my fav'rite find
Quite free, compassionate and kind,
  And purest pleasure prove:

Or be opprest with cank'ring care,
And feel th' effects of fell despair,
  By unsuccessful love.

3. R. T. —— Aliquis, *of* Liverpool, *on Fair* Charlotte.

When seated by fair Charlotte's side,
How sweet the fleeting moments glide!
Those happy moments of my love,
With nimblest speed then seem to move
Soon as the blessing I possess,
To rob me of my happiness.—
But when she's absent, then, alas!
The hours how heavily they pass!
How slowly then their numbers spend!

It seems an hour would never end;
Each moment loit'ring seems to stay
The progress of the welcome day
When Charlotte's presence shall once
  more
Peace to my thoughts again restore—
Thus *Time* dislik'd doth longest stay
And seems when lov'd to fly away!

4. *The same answered by Mr.* G. R. *of* South Audley street, London.

When first I said 'farewell Nan,'
And o'er th' Atlantic shap'd my course,
The Winds forgot my sails to fan,
Or blew not with their usual force:

But home return'd, and bless'd with love,
On heedless *Time* the blame I cast:
The minutes *then* like hours did move,
But *now*, alas! they fly too fast.

5. TIME's *Progress thro' the Stages of Life, by* W. E. *of* Bath.

When mortal man, by providence,
His motley being doth commence
In infancy his matron's care
For youth's pursuits does him prepare.
Preceptors next his pages fill
With learning's treasure, by their skill,
From which, till manhood does arrive,
By fost'ring friends he's taught to thrive
In arts, or scientific line,
In senate, field, or court to shine.
The awful period then presents,
What must determine life's events,
A space, which wisely if possess'd,
He's sure to be by fortune bless'd:
But if, by vice's mighty sway,

Or follies of the fleeting day,
Man's led to pass this precious stage,
The most important of his age,
In vain he doth his efforts try,
Nor on repentance can rely,
A reparation then to make,
For having lost his choicest stake.
He's now press'd on, thro' his career,
By keen remorse, and sad despair,
With spirits sunk, exhausted strength,
Curtailing Nature's fullest length,
When *Time*, with unrelenting hand,
At last destroys the weaken'd band,
And thus consign'd to endless state,
His doom is fixt, where's no retreat.

6. *The answer to the same by Mr.* Rob. Allanson, *of* Middleton.

With secret pleasure I peruse
The flowing numbers of your muse,
  While soaring to sublime:

O'er each mysterious line I pore,
And anxiously your depths explore,
  Till all's reveal'd by *Time*.

7. *To Mr.* Lee, *from Mrs.* Margaret Fitzgerald, *of* Old Moss.

What joy should I enjoy each day,
Were I but blest with thee;

My *Time* would sweetly glide away,
Oh charming Henry Lee.

GENERAL ANSWERS to the ENIGMAS.

1. *Ode to Spring, by Miſs* Alexia Corney, *of* Whitby.

Welcome, ſweet ſpring ! at thy return
  The fragrant roſes bloom,
The myrtle *ſhades* no longer mourn,
  But ſhed a rich perfume.

The clouded ſcenes are fled away,
  The darkſome hours a *Re* gone,
The ſun new gilds the *ſmiling* day,
  And zephyrs hail the morn.

How ſweet to *ſnuff* the balmy air,
  To *bear* the woodlarks ſing,
While drowning the dull voice of care,
  The village *bells* do ring.

Joy ſmiles around, and nimble *Time*
Like *ſhuttle* flies along,   [bine
And ruſtic nymphs and twains com-
  To chaunt the jovial ſong.

Unmindful of their charms, they need
  No broad *umbrella*'s ſhade,
No Gallic *cuſhion* for the head
  Adorns the village maid.

Sweet ſpring revives the lovely laſs,
  Gives flowers to deck her hair ;
But ſhe, unuſed to a glaſs,
  Knows not that ſhe is fair.

No ſpacious *curtains* round the room
  Befit her humble ſtate,
No coſtly ſilks from Perſian loom,
  With pride her heart elate.

In praiſe of bounteous nature's works,
  Her tongue doth ever ſing,
'Tis ſpring lends muſic to her voice,
  The *key* to every ſtring.

2. *On the King's recovery, by Mr.* Thomas Eland.

Join voices every living ſoul,
And ſpread your thanks from pole to
  pole,
Bid every tuneful pipe and ſtring
In chorus join ' God ſave the king'.
' God ſave the king,' ye winds reply,
And bear it to the choirs on high.
Hark how the *bells* their tongues em-
  ploy.
To *ſhadow* forth the gen'ral joy,
On each harmonious *key* they tell
The liſt'ning *ear*, that George is well.
Hear this ye Britons and rejoice,

Ye ſons of freedom raiſe your voice,
Ye lovely virgins of our iſle,
Adorn your faces with a *ſmile* ;
With *noſegays* every boſom deck,
Whoſe plumes like *curtains, ſhade*
  young neck ;
On ev'ry *pincuſhion* be ſeen
Mottos of love to king and queen ;
E'en on his *ſhuttlecock* the boy,
Has got engraved, ' Vive le *Roi* ;'
Long live the king all hearts reply,
Whoſe fame ſhall laſt when *Time* ſhall
  die.

3. *The ſucceſsful Lover, by Miſs* Nancy Linſow, *of* Cameliers.

When from the eaſt the golden ſun
  Had chac'd the *ſhades* of night,
Young Damon roſe to feed his flock,
  And ſeek his heart's delight ;

Fair Mira, *ſmiling* as the ſpring,
  Her *curtains* had withdrawn,
Refuſing the *umbrella*'s aid,
  She nimbly treads the lawn.

The *bells* from far ſalute her *ear*,
  Harmonious in the vale,
While fragrant *ſmells* the air perfume,
  Brought by the weſtern gale.

Damon now left his fleecy care,
  And took his pipe and crook,
With haſty ſteps o'ertook the maid,
  Beſide the limpid brook.

He ſits him down,—no *cuſhion* needs,
  Renews the vows he'd ſwore,
And to incline her heart to yield,
  Repeats as many more.

His honeſt *tongue black* falſhood ſcorns,
  Time like a *ſhuttle* flies,
His cogent eloquence prevail'd—
  He gains at laſt his prize.

4. *The Riddle, by* C——s, *of* Bath.

Ye fair, whose penetrating eyes,
Can pierce enigma's dark disguise,
And hidden mysteries explain,
A fav'rite hopes your *smiles* to gain,
Whose name you seldom fail to hear,
When *bells R*monious strike the ear.
The nymph, array'd in village pride,
With gay *pincushion* by her side,
And true-love knot upon her breast,
Does prize me m re than all the rest
The stripling, innocently gay,
Who loves at *shuttlecock* to play,
Or lays his marbles in the pound,
And stoops to knuckle on the ground,
With eye attentive marks my round,
If, when tempestuous storms invade,
You seek th' *umbrella*'s friendly aid,
Or as the evening *shades* prevail,
You sleep within the *curtains* vail,

In either case I'm still your friend,
For 'tis on me they both depend;
And while you're sleeping, if you please,
I hold your watch, your purse and *keys*.
In foreign climes, as story goes,
I lead the natives by the *nose*;
But in Britannia's polish'd land,
I oftener take them by the hand,
And from the sprightly *Maypole* dance,
Or with the accomplish'd fair advance,
And proud t'attend our gracious queen,
Add lustre to the birth-night scene.
But not confin'd to age or clime,
I range thro' ample space and *Time*,
As far as Saturn's orb you see,
An emblem of eternity.

5. *The same by Master* George Valentine Knibb, *aged nine years, Pupil at Mr.* Hunt's *Boarding School, at* Stony Stratford.

1. At return of the spring,
　　When the village *bells* ring,
And the lads and the lasses are gay;
　　In the poplar's *shade*,
　　My retreat oft is made,
For tis there I enjoy the sweet May.

2. See the meadows how green,
　　And the air how serene,
What a fragrance exhales all around!
　　'Tis soft music I *hear*,
　　The gay warblers appear,
And my heart still *exults* at the sound.

3. Here the Diary can please,
　　As I sit at my ease,
And delighted th' enigmas *explore*;
　　Being just broke from school,
　　N w my pleasure bears rule,
And this is the k I adore!

4. An *umbrella* I find,
　　Makes out one to my mind,
And an *R* too will answer the next;
　　Bed *curtains* and *nose*
　　Two more will disclose,
So think not I'm greatly perplex'd,

5. Had I *Time* to pursue
　　What I glory to do,
I wou'd answer much more than you
　　I would *smile* at the pains, [see,
　　Still or racking my brains,
For the prize greatly animates me.

6. Shou'd that be my lot,
　　It wou'd ne'er be forgot,
Nor my pen, ink, and paper be vain;
　　I wou'd care not a *pin*
　　What else others may win,
Cou'd I but this favour obtain.

6. *Address to Lady* Diaria, *by Mr.* Jos. Cowing, *of* Newcastle.

The *Time* now draws nigh,
　　To make a reply
To the *R*-iddles you sent us this
　　year;

And in truth every part
　　So delighteth the heart,
We are charm'd with the figure you
　　bear.

With

With pleafure we find
Umbrell's to our mind,
Keys, curtains, and all that look gay ;
The whole of your treat
Is fo good and fo neat,
You refemble fair Flora in May.

Each fubject you hit,
You enliven with wit,
Whether bell, fhadow, or fhuttlecock ;

With a note that is fine,
A fmile you combine,
Alfo pincufhion, ear, and what not.

Your plan ftill purfue,
Send us fomething that's new,
Let Apollo with Euclid combine ;
Each fex, young and old,
Prize you more than gold,
And proclaim you the firft of the nine.

7. The anfwer to the fame by Mrs. Elizabeth Richardfon, formerly Mfs Betty Smales, in verfes on her late marriage with our ingenious correfpondent Mr. Robert Richardfon, upon which occafion fhe wittily and humouroufly obferves thus :

"My moft worthy, and moft honoured friend, the author of the Ladies Diary, will pleafe to obferve that for many years paft I appeared under the name of Betty Smales, till Robert Richardfon of Frofterly after many long refearches found out my place of abode, and came with fubtilty and took away my good name ; therefore the only way of repairing that lofs, is to fubftitute E. Richardfon for Betty Smales."

When fhuttlecocks, pincufhions, nofegays, and bells,   3, 10, 9, 1
Thofe childifh amufements, gave way
To fweet vocal woodlands, cool grottos, and dells,
And love was the theme of my lay :

Dear freedom was then the delight of my foul,
Tho' forrow oft clouded my breaft,
Thro' the fhade I could break, could my paffions controul,   6
And my life was a fhadow of reft.   2

At length the kind gods drew the curtain of fate,   7
And a lovely young ftranger appear'd ;
Adieu, then, the freedom I boafted of late,
His chaRms with fuch rapture endear'd !   4

He fmil'd while he view'd me, and as he drew near,   11
His eyes threw a foul-melting dart ;
He whifper'd his fond tales of love to my ear,   8
In accents that thrill'd thro' my heart.

That moment he offer'd his heart and his hand,
(While his laurels he threw at my feet)
I freely accepted, —'twas love gave command.
And wedlock our blifs made complete.   5

Now foftly our moments fhall roll into years,
And Time the fweet paffion improve ;   12
Our bondage is freedom, delightful our cares,
For our cot is the manfion of love.

8. *Addreſs to Miſs* Sally Browne, *by Mr*. Robert Allanſon,
Middleton, Yorkſhire.

How pleaſant and joyful my *Time* would be ſpent,
If you, my dear fair-one, would freely conſent
To an union of hearts by the joining of hands,
And partake of the bleſſings of Hymen's ſoft bands.
My hand and my heart, with my corn and my wine,
And the *keys* of my treaſure I'd gladly *R*-eſign.
Th' *umbrella* of pleaſure ſhould *ſhadow* your head,
And jealouſy's *curtain* ſhould never be ſpread.
Together through meadows and fields we would ſtray;
Fine *noſegays* of blue-*bells* I'd pluck by the way,
And *pin* to your breaſt with aſſiduous care,
While *ſmiles* of applauſe make you quite debonnair.
My heart like a *ſhuttlecock* leaps in my breaſt,
When I think on the joys with which we may be bleſt.—
But ſhould ſome happy rival thoſe bleſſings firſt take,
Who lives on your charms, and would die for your ſake,
Be pleas'd to inform me,—tho' fatal to *hear*! ———
So madam I bid you adieu till next year.

9. *On Life, by Mr*. Iſaac Gumley, *of* Anſty, *near* Leiceſter.

Ah! what is life, with all its vain parade!
'Tis but a tale, an unſubſtantial *ſhade :*
'Tis like a *ſhuttlecock* the boys to chear,
Or like a *bell*, whoſe tinkling charms the *ear* ;
'Tis like a *curtain* that is quickly drawn,
Or like a cloud, that ſhades the flow'ry lawn ;
'Tis like an odou*R*, that regales the *noſe*,
Yet flits about with every wind that blows ;
'Tis like a falſe deluding harlot's *ſmile*,
Which does full oft the thoughtleſs ſwain beguile ;
'Tis like a ſhip, that's toſt about at ſea,
'Tis like a bolt, that's mov'd with every *key* ;
'Tis like the *umbrage* o'er fair Delia's head,
That now is ſhrunk, and now is amply ſpread ;
'Tis like her *cuſhion*, fill'd with many a dart,
To pierce, to wound, and agonize the heart ;
'Tis like a ſpan, 'tis like the falling rain,
'Tis leſs than nought, and altogether vain.
    O may we then our fleeting *Time* improve,
And, heaven-directed, fix our minds above,
Bid theſe low ſcenes, this empty world adieu,
And, fir'd with zeal, the way to bliſs purſue.

10. Philadelpia's *addreſs to the Rev. Mr*. Baker.

Say, whe*Re* is Baker, Diary's rev'rend friend ;
Shall we no more his ſoothing numbers hear ?

Nor he his thoughts in strains harmonious send,
Sweeter than *cymbals*, to the ravish'd *ear* ?   1, 8

Has Heaven, in anger for our follies, took
Our much-lov'd bard,—our monitor away;
Or in disgust has he our tribe forsook ?
And will no more his mystic powers display ?

He on such trifles oft would moralize
As *shuttlecock, pincushion, nose,* or *key*,   3, 10, 9, 5
While on his lines we'd pore with glistening eyes,
And own the force of intellectual day.

While in the night the *curtains* use we prove,   7
Or shelter'd by th' *umbrella* from the rain,   6
While *smiles* shall be the harbinger of love,   11
And *Time* and death a respite give from pain: 12

So long shall Baker's virtues be rever'd,
Who taught unguarded youth the road to bliss,
Whose gen'rous sentiments full oft declar'd,
Not empty *shadows*, but the truth was his.   2

11. *An Elegy on a young Gentleman who died very suddenly, by Mr.*
John Fildes, *Schoolmaster,* Liverpool.

Beneath yon yew tree's venerable *shade*,   2
A much-lov'd youth lies number'd with the dead :
In *earth*'s cold bosom are his relics laid,   8
To endless bliss his passing soul is fled.

Tho' short the *Time* he spent on life's great stage,   12
He in the paths of virtue ever trode ;
No gaudy *toys* could e'er his heart engage,   3
He lov'd his neighbou R, and he fear'd his God.   4

His words and thoughts he weigh'd in reason's scale,
O'er others foibles he a *curtain* drew ;   7
He in good nature ne'er was known to fail,
In him a friend the sons of mis'ry knew.

Last Sunday noon I saw him cross the green,
A new *umbrella* in his hand he bore;   6
Unusual *gladness* in his face was seen,   11
And at his bosom he a *nosegay* wore.   9

Ah ! sudden change ! before the solemn *bell*   8
With awful sound proclaim'd the *close* of day,   5
He from his downy *cushion* speechless fell,   10
And on the floor a lifeless corpse he lay.

12. *Contemplation in a Church yard, by Mr.* J. Walton, *of* Allen-
Town.

What's man !—a thing of nought, a fleeting *shade*,   2, 6
Whose *Time* rolls on, as flows the rapid flood,   12

Ne'er to return; nor ever flops its pace,
Till down, alas! he's hurry'd to the grave,
Where filence reigns, and ghoftly teRror ftalks
Around the hallow'd fanes and gloomy vaults.——
Here lies perhaps the generous and humane,
The honeft neighbour, and the trufty friend:
Or underneath a fpiry tuf of grafs
Perchance there moulders in her kindred duft,
Bell-inda, once the envy of her fex;
Whofe winning *fmiles*, and graceful air and mien,
Her fparkling eyes, her *nofe* and dimpled cheek,
Might fire the youth, and captivate the fage.
But now, alas! her tuneful voice no more
Affails the *ear*, or warbles to the lute.
The filent tomb is now her lonely *bed*,
Where rank corruption mars her comely frame.——
Here lies the aged, there the hopeful youth,
Whofe tender years were fpent in childifh *fports*;
Or there a daughter, the fond mother's care,
Who while on earth did all her *cares* engage.——
Pack'd clofe together in this manfion lie
The rich, the poor, the vaffal and his lord.
Then why fhou'd we, puff'd up with pride behold
The poor or deftitute, of equal mould;
Since one event awaits the fons of men,
And duft with duft is mingled in the grave.

See the acknowledgments and many other anfwers in the Supplement to the
Ladies Diary.

***

Answers *to the* Rebuses *and* Charades.

Rebufes. 1 Smales, 2 Freeman, 3 Jonfon, 4 Mary * Swift, 5 News.
Charades. 1 Bargain, 2 Teapot, 3 Cowflip, 4 Seafon, 5 Woman, 6 Fare-
well, 7 Crabtree, 8 Spring-tide.

* *Although the author of this 4th Rebus, meant the word for Swift, many
others will equally anfwer it, as Young, Prior, Homer, Watts, Shakefpeare,
&c.; and accordingly all thefe names are given in anfwer by the different cor-
refpondents.*

1. *The Rebufes anfwered by Mr.* John Holon, *near* Darlington.

Say charming *Smales*, and *Freeman* fair,
 Jonfon as goddefs chafte,
And *Mary Swift*; pray all declare
 How you the Diary grac'd.

'Tis thought that features fo divine,
 By no *news* efe cou'd prove,
But Richardfon had woo'd the nine,
 And brou't you from above.

2. *By Mr.* Robert Allanfon, *of* Middleton.

Long has my mufe neglected lay,
 Of *Smales* nor *Freeman* fung;
Nor hailed *Jonfon's* natal day,
 Nor that of *Mary Young.*

But now glad *news* infpires my breaft,
 And animates my ftrains;
For Chloe confents to make me bleft,
 And eafes all my pains.

3. An

3. *An Inquiſition, by Mr.* Myton Tweedell, *near* Darlington.

Tell me, dear ladies, *Freeman* fair,
 Jonſon as goddeſs chaſte,
And *Mary Swift*, pray all declare,
 To me the *news* in haſte;

Has lovely *Smales* to Richardſon
 Given her hand and tro'h?
If ſo, Hymen his part has done,
 In juſtice to them both.

4. *Invitation to* Delia *to take an Evening Walk, by Mr.* J. Walton, *of* Allen-Town.

When gentle zephyrs fan the trees,
 And Sol's refulgent beams
Paint all the weſt in purple robes,
 And pregnant nature teems:

Then let us wander thro' the grove,
 Or o'er the verdant plains;
The warbling ſongſters from each
 ſpray,
Shall ſing their choiceſt ſtrains.

Not all the bloom of youthful pride,
 Nor *Freeman*'s fluent tongue,
Nor *Jonſon*, tho' ſo much renown'd,
 Nor charming *Mary Young*,

Shall ever make my fancy roam,
 Then haſte, my fair, and come,
To ſpend a friendly ſocial hour,
 And view the ſetting ſun.

N.B. The *News* papers have announced the marriage of Miſs *Smales* to Mr. Richardſon.

5. *Addreſs to Lady* Diaria, *by Mr.* William Hart, *of* London.

O'er your lov'd pages let me pore,
And all your hidden nymphs explore;
Say, is the beauteous *Freeman* there?
Yes, claſs'd among your virtuous fair;

The lovely *Jonſon*, *Smales*, and *Prior*,
Let maids like theſe inſpire my muſe,
My warmeſt wiſhes riſe no higher,
Nor court applauſe in public *News*.

6. *The Rebuſes and Charades, by Mr.* Thomas Croſbey, Peaſehaulm, York.

Remote from town, where care and
 ſtrife
More thorny make the path of life,
 Young *Freeman* dwells at eaſe,
Regardleſs how the proud and vain
Their *Seaſons* ſpend in giving pain,
 Or pain themſelves to pleaſe.

Yet ſometimes *Smales* his thoughts
 employ,
That charming *woman* can't annoy
 A friend of Lady Di's;
He reads her lines, he finds her name
Recorded in that page of fame
 Where *Mary Prior* lies.

It ſeems Miſs *Jonſon* won his heart,
Tho' he is ſhy to tell his ſmart,
 Such *news* he would conceal;
Till laſt ſpring-tide he with the fair
O'er beds of *Cowſlips* took the air,
 His paſſion to reveal.

He ſqueez'd her hand, he preſs'd his
 ſuit,
But ſtill the fair remained mute,
 She liked not the *bargain*,
But turn'd the ſtile, adjourned for
 tea,
Conſults her mother what's to be.
 Farewell to all ſuch jargon.

7. *Addreſs to Miſs* Agnes A——n, *by Mr.* Thomas Higham, *of* Lancaſter.

Ariſe my dear Agnes ariſe,
Oh come! let us tread the meads o'er,

For Sol has aſcended the ſkies,
And the night vapour hovers no more.

New sweets shall enliven the way,
Rich odours perfume the fresh air,
While the plum'd choir bill on the
    spray,
And all things the *season* declare.
While the *cowslip* I cull from the
    green,   [rock,
And the *spring-tide* loud dashes the
While the *crabtree* deep shades the ga,
    scene,
And the shepherdess watches her flock.

Miss *Freeman*, and *Jonson* will join,
Along with the fair *Mary Young*,

And *Smales*, who delights in the nine,
And charms every grove with her song.

While your *woman* a *bargain* concludes
For a *teapot* to cheer your return,
So careless will rove thro' the woods,
And enjoy the fresh breath of the
    morn.

But soon may the moment advance,
When Hymen shall grant me my fair!
When your charms shall my bosom
    entrance,
Farewell then to sorrow and care.

See other Solutions, &c. in the Supplement.

Answers *to the* Queries.

Query 1. *Answered by Mr.* J. Walton, *of* Allen-Town.

The natural inclination of the sexes to unite with each other renders it merely impossible for friendship without love to exist between them; but especially where circumstances are not so embarrassing as to render an union of the parties improper. Therefore, that love after marriage ought to be discouraged as a breach of the 10th commandment, " Thou shalt not covet thy neighbour's wife." Yet, if upon carefully examining your own consciences, you find yourself entirely free from such desires, friendship is laudable, as due to all in general, and ought to be encouraged.

The same otherwise by Mr. J. Hunt, *Master of the Boarding School at* Stony Stratford.

As a strict friendship between two persons of opposite sexes borders so nearly on love, it may be difficult to distinguish the one from the other; but when love is grounded on disinterested friendship, and influenced only by virtue, I esteem it " the source of ever sublime delight;" and in such a sense it may be understood to be that passion which worketh no ill to its neighbour; and therefore it may, with some degree of propriety, be cherished in both parties, after the marriage of either is consummated.

Query 2. *Answered by Mr.* John Dalton, *of* Kendal.

The observation in this query is perhaps as well founded as any in meteorology; a red morning particularly is almost constantly followed by rain or wind, or both; and, as is intimated in the query, the observation is not new, nor confined to a particular place; being also mentioned both by Homer and Virgil.—But with regard to the cause, I am afraid nothing but hypotheses, unsupported by facts, can be advanced, as our philosophy of the atmosphere is yet only in its infancy. There need, however, be no wonder that similar appearances in the evening and morning are followed by different consequences, as the air in the former time is generally in a cooling state, and heating in the latter.

The

The same by Mr. Nicholas King, of Pickering.

As the red rays least alter their direction by refraction, they cannot be seen in the morning, unless the clouds be low, and full of watry particles: the red being the highest of the prismatic colours. But the clouds must be at a great height, and the air free from such particles, for the red rays to be seen in the evening. Otherwise the purple and other colours would appear.

Query 3. Answered by Mr. John Heslop.

It is well known that all animal substances, when exposed to the air, will soon undergo putrefaction, if nothing is applied to prevent it. It is therefore very probable that the varnish fills up the pores on the surface of the shell, and thus excludes the admission of the air.

The same by Mr. Ralph Burton, Land Surveyor, at Salton.

All animal and vegetable substances have in their composition, a certain portion of fixed air; and so long as the whole of that air remains, the body will be preserved from putrefaction, and not much longer: hence painting, varnishing, &c. have been found to preserve wood and o her substances, because the crust or skin formed on their surfaces hinders the transpiration. But perhaps the best method of preserving eggs, would be to keep them surrounded with fixed air in a close vessel.

Query 4. Answered by Mr. Robert Barwick, of Ringstead.

The vapours being drawn up into the air in the day time, by the heat of the sun, fall again in the night; whence there are commonly more vapours near the earth's surface in the morning than in the evening; which vapours are passed through by the rays coming from the sun, and the more vapours the rays pass through, the less distinctly the object is seen. And it is a well-known principle in optics, that the same object will appear larger when it is seen confusedly, than when it is seen distinctly.

The same by Mr. John Craggs, of Hilton, near Durham.

Common experience has shewn us, that all objects appear to subtend a greater optic angle in dim or dense mediums, than in rarer ones. And the vapours abound more copiously in the morning, after the cold of the night, than in the evening, after the heat of the day has dispersed the vapours.

Query 5. Answered by Mr. J. Walton, of Allen-Town.

The person who sees or hears another yawning, and does the same, is not compelled to do it by unavoidable necessity; since it is only a sympathetic affection that affects a person in the same manner as several other affections; and may be prevented unless voluntarily indulged. And this may easily be done by looking steadfastly at the person yawning, and other means.

The same by Mr. Alexander Rowe, of Reginnis.

Yawning seems to be communicated by sympathy, where there is a ready disposition in all the organs of sensation to receive, perform, and communicate the symptoms of it, for a continuance of the same thing.

Query 6. nsw. by Mr. T. King, jun. of Lambert's Castle-hill.

I think the single microscope is the most proper for nice examinations, because we can see more clearly at a small distance through it, and it shews the object brighter, though not so much magnified as a double one.

The

The same by Mr. John Needham, of Hinkley.

The compound microfcope is the moft proper to view fmall objects with, becaufe it makes vifion more diftinct and pleafant, by properly atempering the rays of light, and enlarging the field of view. The firft conftruction was with two glaffes only, then a third was added for the improvement of the invention, and at laft a fourth to complete that improvement. And you will eafily find that they have each of them their peculiar ufes, in producing the great effect of a magnifying power in the beft manner poffible. There- fore the compound microfcope muft have the advantage.

See many other anfwers to the Queries in the Supplement.

NEW ENIGMAS.

I. ENIGMA 721, *by* Eugenio.

Behold ye fair a friend appears,
A friend who in thofe early years,
 When frequent troubles feize,
Stood ever ready to impart,
By gentle fafcinating art,
 Tranquility and eafe.

And, tho' by fome perhaps forgot,
Still may I boaft the envied lot,
 Your fond regard to hold ;

To draw at morn, or ev'ning hour,
Your hearts with more attractive
 Than can the mifer's gold. [pow'r

What tho' I boaft not lofty birth,
Yet confcious of my pow'r and worth,
 You in my care confide.
Another hint, and then I've done,
Progreffive motion I have none,
 But move from fide to fide.

II. ENIGMA 722, *by Mr.* John Stafford, *of* Bingham.

When hoary winter quits the flaccid
 round, [fpreads around ;
And blooming fpring fweet odours
Then Phebus' rays illume the orient
 fkies, [vifh'd eyes ;
And Terra's bounties greet our ra-
While from Feronia's fhades, the fea-
 ther'd throng
Enliven nature with a ruftic fong.
See how the lovely nymphs and youth-
 ful fwains, [dant plains ;
With hearts elate, trip o'er the ver-
While each, by pleafure's radiant
 charms poffefs'd, [ther's breaft.
Combine to pluck me from my mo-
Forc'd from my peaceful home my
 bleft abode, [croud.
I'm made the fport of gay Vitula's
Like Ganges' tide, of coftly gems I
 boaft, [hoft ;
And gain th' attention of a mighty
While nature feems in ev'ry face to
 fay, [to day !"
" Avaunt dull care, we know thee not

Difplay'd aloft, Favonius fweets I
 fhare, [air:
And, like the Genii, fkim the limpid
While pæans warble foftly as I move,
And ruftic notes falute the fkies a-
 bove.
 When fair Theana virtue's gem re-
 fign'd, [kind ;
To him who'd vow'd to prove for ever
The am'rous youth from her embraces
 flew, [to do:
And fought her not as he was wont
Eager the nymph, now driven to de-
 fpair, [meet him there:
Thro' woods and meads fwift flies to
But ah ! 'tis vain, th' ungrateful youth
 is flown, [bemoan:
And left the fair her weaknefs to
Her hopes now fled, forlorn fhe yields
 her breath. [of death:
And hides her fhame within the jaws
And where her corfe to endlefs reft
 is laid,
I vigils keep, in innocence array'd.

III. ENIGMA

III. Enigma 723, *by Mr.* William Gradidge.

In jerkin fhort, and nut-brown coat I live;
Pleafure to all, and pain to all I give;
Quivers I have, and pointed arrows too,
Gold is my dart, and iron, is my bow.
Nothing I read, yet many things I write;
I never go to war, yet always fight.
Nothing I eat, yet I am always full;
Poifons from herbs, and fweets from flowers I **cull.**
A fpotted back I have, and earthen fcrip;
Black is my face, and blubber is my lip;
No tears I fhed, and yet I always weep;
Sleeping I wake, and waking do I fleep.

IV. Enigma 724, *by Mr.* William Evans.

When fable fhades clofe in the weftern fky,
And round the fold the fheep and fhepherd lie,
The tuneful tribe fit filent on the bough,
And half the world a fhort oblivion know,—
Then elf-like I my magic powers difplay,
Raife forms ærial, darknefs turn to day;
I fway alike each ftate and ftage of life,
Ye all have known me, widow, maid, and **wife;**
The fighing virgin, and the love-lorn fwain;
Perhaps through me a tranfient blifs obtain;
But fhould I prove averfe, then dire diftrefs
And horror reigns, which every fenfe opprefs;
The bofom beats, the eyes with tears o'erflow,
In all the agonizing forms of woe.
Of old (for old's my date and wide my fame,
And holy record does enrol my name)
I was obferv'd as no vain fing fong thing,
By fage and faint, by beggar and by king;
But now fcarce any mind me, fave a few
Fantaftic matrons, and the vulgar crew;
For your fair minds, from fuperftition free,
Are far too elevate to credit me.
Yet deign reveal this ftrange familiar thing,
Which to each fex can pain or pleafure bring.

V. Enigma 725, *by Mr.* Ifaac Gumley, *of* Anfty, *near* Leicefter.

Attend all ye doubting, ye fadly faint-hearted,
From whom every gleam of fweet joy is departed;
Tho' hellifh defpair fhould envelope your fouls,
One glance of my eye all his madnefs controuls;
Whene'er I appear, his abode he refigns,
And cannot accomplifh his wicked defigns.—
When Job was oppreft with unfpeakable grief;
I aided his patience, and gave him relief.

Good

Good David fpeaks of me, for oft did he find
In me a rich cordial to comfort his mind.
Infpired by me the great prophets and fages,
Of latter and antediluvian ages,
Paft chearfully through the dark valley of life,
Midft troubles furrounding, and heart vexing ftrife.—
In cots low and gloomy, where plenty ne'er flow'd,
Where meagre fac'd poverty makes her abode,
Where ficknefs difcovers her languifh ng head,
And children hang round their fond parents for bread;
Even here I enliven the indigent fwains,
And make the afflicted forget all their pains.
The monarch that glitters in coftly array,
Whofe will potent nations with pleafure obey,
Tho' his laudable actions have gain'd him renown,
Unaided by me, would fink under his crown.—
In fhort, every daughter and fon of old Adam,
The beggar in rags, and the high flaunting madam,
Muft own there is none that can give them relief,
Or fo foon as myfelf diffipates all their grief.
Yet tho' as a bleffing to man I was given,
I ne'er fhall be found in the kingdom of heaven.

VI. Enigma 726, *by Mifs* Louifa Amelia Harpur, *of* Briftol.

In enigmatic lore a place I claim,
Whofe fhining worth has long been known to fame.
Where glitt'ring grandeur forms the gay parade
Of fplendid balls, or midnight mafquerade,
In bright pre-eminence I firft appear;
A gaudy helm or burnifh'd circlet wear.
Yet not in grandeur's fcene alone I dwell,
I'm often found within the lowly cell,
Where penitence the mifpent hours deplores,
Or ftudious learning wifdom's paths explores.—
To tend me well, as proves the facred page,
Should your attention and chief care engage.
But if this duty you too often flight,
Beware of doom in realms of endlefs night.

VII. Enigma 727, *by Mr.* William Jones, *of* Heyford.

In a far-diftant clime with my parent I grew,
Till doom'd a fit flave, lovely fair-ones for you;
Then my nature-form'd armour, my fcented array,
By a fwarthy-fac'd mortal are taken away;
To compenfate the lofs, and my virtues fecure,
In a mantle of white I frefh hardfhips endure.
By Neptune's brave fons I'm to Britain convey'd,
Where all that folicit are fure of my aid;
Some for my reception prepare a retreat
That fancy and art ftrive to render complete.

The firft is difcover'd in mimical pride,
The other contrives a fell monfter to hide,
From whom, O ye fair, all my woes I derive,
For his treatment's fo cruel I never can thrive.
When force makes the wide-ftretching portal give way,
My form muft experience a rapid decay;
Then I mix with the croud, with Io I join,
The offspring of Ceres, and juice of the vine ;
With ftrangers and natives promifcuoufly plac'd,
By moft I'm efteem'd an improver of tafte.
Sometimes to my dame I admit a warm friend,
Who for the fame motive purfues the fame end.
Tho' many my virtues, this rare one I boaft,
I often am known to give charms to a toaft.

VIII. Enigma 728, *by Mr.* Henry Lee.

Ye lovely fair, whom polifh'd manners grace,
A gay intruder boldiy afks a place :
Good-breeding fpurns me hence ; yet know, 'tis mine
To give a fervency to looks divine.
By diftant hints from me you oft may trace
Defign and cunning under friendfhip's face :
Then, oh, be timely wife, and warn'd, beware
Th' impoftor's dark, diffimulating fnare,
I give difcernment to the learn'd, and wife,
And add frefh luftre to your killing eyes !
I'm rarely known when thoughts perplex the brain :
Thoughtlefs oft born ; and thoughtlefs die again :
Common by day ;—at night when flumbers creep,
My brilliant fource is, top-like, *lafh'd* afleep.

IX. Enigma 729, *by* Mancunienfis.

Ye fair, permit me on you now to wait,
And with attention hear what I relate ;
And when you've heard, I pray declare my name,
And wreaths of laurel fhall difplay your fame.
Scarce doth bright Phœbus raife his golden head,
From the foft pillow of his eaftern bed ;
Scarce doth the early lark, Sol's herald, pay
His morning tribute to the new-born day ;
Before I from the earth triumphant rife,
To join my brethren in the azure fkies ;
Where we in triumph reign, amid the blaze
Of Sol's refulgent ever chearing rays.
But ah ! how fhort and tranfient is our reign,
For we to vifit earth again muft deign ;
Soon as the fun beneath the weftern fky
Has funk his golden orb, our fall is nigh.
But ftop ye fair ! do not our fate deplore,
We do not fall to rife again no more ;
For when the fun with glory doth adorn
The eaft, we triumph in the beauteous morn,

And rife again, our former reign difplay,
Till night doth veil the glorious face of day.——
If from what's faid you can't my name reveal,
" Take one hint more, then is the myftic tale
" Weakly fecur'd beneath enigma's veil;"
We often hang upon the rip'ning grain,
And often glitter in the verdant plain.

X. ENIGMA 730, *by Mr.* Robert Richardfon, *of* Wolfingham, *formerly of* Frofterly.

In Cytherea's flow'r-embofom'd groves,
Where Venus leads her train of wanton loves,
Joyous I bloom, and greet each rifing day ;
Bleft, while my parent goddefs leads the way :
Bleft, while with her I tread th' enamell'd green ;
Live on her lips, and fparkle in her mein ;
While envy, haggard care, and foul difdain,
Fly far away, and fhun the hated plain.
In Britain's royal queen, fupreme I fhine ;
And, her fair daughters' lovelieft charm is mine.
I bid the pris'ner live, the lover rife,
Widows and orphans ceafe their piercing cries,——
When Royal George appears in regal ftate,
Thoufands for me, expectant, daily wait.——
The proftrate penitent, with downcaft eyes,
Sues heaven for me with tears and heaving fighs ;
Yet ftory fays, in fate's eternal round,
With furies, imps, and demons, I've been found !
'Tis yours, ye fair, to make me all your own ;
Wear but my badge, and, ev'n when youth is flown,
A wond'ring world fhall own your matchlefs pow'r,
And beauty fhine to life's declining hour.

XI. ENIGMA 731, *by* I. E. Strephon.

Permit, ye fair, in your fam'd page t'appear
A worthy object, truly worth your care.
Such lovely looks, and eafy airs I give,
That I'm admir'd by all things that do live :
I'm fo admir'd, that I may fafely boaft,
Of all the town I am the fovereign toaft :
And where the bacchanalian fons are found,
To me the flowing bowl full oft goes round ;
Which vile repeated routs I can't abide;
And oft times fly will from their prefence glide.
While my fweet charms do young Philander grace,
My charming influence fmiles upon his face ;
Strengthens his nerves, and bids his heart rejoice,
And fets to fofter ftrains his foothing voice.
But if perchance I leave the happy fwain,
He fighs my abfence with a lover's pain ;
For me difconfolate, he feeks the groves,
The field and lawns, where wont to fhare my loves :

But

But if in vain ;—with some learn'd confident,
He seeks to know what way may yet be bent :
And if perchance they should successful prove,
And I return Philander's fervent love ;
The rosy bloom straight reassumes his face,
And all his features shine with wonted grace.—
Think not my favours to this youth confin'd ;
'Tis just the same with you, and all mankind.
Then tell my name, from these my humble strains,
And may my smiles reward your willing pains.

XII. or Prize ENIGMA 732, by Candidus.

Behold in me a multifarious creature,
With many names, but with no leading feature ;
Whose qualities and definitions vary,
As Jack from John, or Molly does from Mary.
I'm noble, mean ; I'm great, though sometimes small ;
By most respected, yet a bane to all.
To me sly statesmen point their crafty views,
And sigh for what the worst of rogues refuse :
I'm lov'd, esteem'd, yet branded, low and base ;
The child of honour, and the fiend disgrace :
At courts caress'd, tho' scourged in the country ;
I help the virtuous, and reward effront'ry.
Tho' dull, inanimate, none e'er inherit
My fame and fruits, without some share of merit ;
For so the wisdom of great George decrees ;
Whose choice is virtue, and whose sway is peace.
Large are my projects, and my travels wide ;
To ev'ry port and country I'm allied :
What tho' I lull anxiety's suspence,
And ease the heart, and calm the doubting sense ;
Ev'n now perhaps the messenger of ill,
I bear the wailings of the boding quill.—
Sometimes I boast the gaudy herald's blazon,
And kings and dukes expose for crouds to gaze on :
Those heroes too, who boast few friends at court,
Often on me depend for firm support.
In doctrine orthodox, mankind I teach
The paths of truth and rectitude to reach.—
These are my many properties and uses ;
Which like most things are subject to abuses :
Then guess me, and be thought a witty elf ;
If not, remain as stupid as myself.

NEW REBUSES, CHARADES, and QUERIES.
I. REBUS, by Adalina.

What once bore Heros thro' th' embattled field,
Join'd to the place that golden stores doth yield,

Shew what's in use with many a courtly dame:
See Archer's face, you'll quickly guess its name.

II. REBUS, *by Mr.* William Boyer, *of* Golden Hill *Free School* Leyland.

Guess what's the reason why a man in years
Oft hangs a perriwig about his ears,
And what that is that Bacchus holds so fine;
Three-fourths of this, unto the first combine;
And you've a lady in our northern sphere,
Who shines a pattern to the fairest fair.

III. REBUS, *by Mr.* Robert Richardson.

To the symbol of innocence join
Three-sev'nths of what Britons hold dear;—
See a nymph on the banks of the Tyne,
Where crowds of fond lovers revere.

IV. REBUS, *by Mr.* Thomas Waring, *of* Leicester.

To three-fourths of a clown, join, of Abraham's race,
Three-fifths of his son who abounded with grace.
To a musical instrument next you must add
The country where Abram his being first had.
These connect, a poetical fair you will find,
In whose soft flowing verse, wit with beauty's combin'd.

I. CHARADE, *by Mr.* John Fildes, *Schoolmaster,* Liverpool.

When first my *whole* in due obedience fail'd
A lasting *first* was on my *next* entail'd.

II. CHARADE, *by* Antonia.

My *first* once rode by ladies fair,
But now is out of use;
My *second* will secure what's rare,
And save from all abuse.

To know my *whole*, Mat. Pri'r will
A poem to your aid;　　　[lend
Mungo likewise will you befriend,
And to the answer lead.

III. CHARADE, *by Mr* William Jones, *of* Heyford.

My gipsey-visag'd *first* such terror spreads,
The miser shrinks, the guilty hide their heads;
The gay coquet, my *next* puts on with care,
To aid her beauty, and all hearts ensnare;
But seeks my *whole* when compliments are o'er,
When pleasure droops, and conquest charms no more.

I. QUERY, *by Mr.* William Jones, *of* Heyford.

Required the origin and explanation of the English phrase, "Hobson's Choice."

II. QUERY, *by Mr.* Henry Lee.

The origin and best definition of the Ancient Oracles is required.

⁎ *See the other Rebuses, Charades, and Queries in the Supplement, which could not be inserted here for want of room.*

ANSWERS to the MATHEMATICAL QUESTIONS.

I QUESTION 893 answered.

THIS question is answered by our Correspondents, on three different principles; 1st by making the whole amount of the annuity equal to that of the orginal sum; and its interest for the time sought, both computed at simple interest; 2dly by making the same amounts equal, when computed at compound interest; and 3dly substracting the annuity every year from the principal sum or debt, and its interest, till the whole shall be extinguished. We shall therefore insert a solution upon each of these three different principles. And first by simple interest,

By Mr B. Benson, of Croston.

Put $p = 900$ the principal, $a = 83.5$ the annuity, and $r = .045$ the rate, also t the time sought. Then $p + ptr$ is the amount of the debt in t years, and $at + \frac{1}{2}at^2r - \frac{1}{2}atr$ is the amount of the annuities and the interests; therefore $p + ptr = at + \frac{1}{2}at^2r - \frac{1}{2}atr$; which reduces to this $t^2 + \frac{2}{r} - \frac{2p}{a} - 1 \times t\, (st) = \frac{2p}{ar}$; and hence $t = \sqrt{\frac{s^2}{4} + \frac{2p}{ar}} - \frac{s}{2} = 13.5268$ years, the time sought.

2dly by Comp. Inter. by Mr Geo. Stevenson, of Howdon Dock.

This question is similar to question 100 of Hutton's Mathematical Miscellany, and is resolved at pa. 279 and 280 by two different ways, the second of which is this: Put $a = 83\frac{1}{2}$, $p = 900$, $R = 1.045$, and t the time sought; then pR^t is the amount of the principal p at compound interest for the time t, and $\frac{R^t - 1}{R - 1} \times a$ is the amount of the annuities for the same rate and time; therefore $pR^t = \frac{R^t - 1}{R - 1} \times a$, which reduces to this equation $R^t = \frac{a}{p + a - pR} = \frac{a}{a - pr}$, putting $r = R - 1 = .045$ the interest of 1 pound for 1 year; then, taking the logs. of this equation, $t + \log.$ of $R = \log. \frac{a}{a - pr} = \log. a - \log. \overline{a - pr}$, and hence $t = \frac{\log. a - \log. \overline{a - pr}}{\log. R} = \frac{0.2882180}{0.0191163} = 15.07708$ years, the time sought.

II QUESTION 894 answered by A. Whitehouse, of Wolverhampton.

At first he had 2000 crowns at 91 pence per crown, out of which he pays $\frac{3}{20}$ per cent. or $\frac{3}{20}$ of $\frac{1}{100}$, that is $\frac{3}{2000}$ of the 2000, amounting to 3 crowns brokerage; and therefore he is to have remitted back

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the remainder or 1997 crowns, after deducting the $\frac{1}{3}$ per cent. or the 300th part of them, or 6·65666, that is, he is to have remitted to him 1990·34333 crowns at 93 pence per crown, which amount to 185102 pence nearly; out of this deduct 2000×91 or 182000 pence, the original value, and there remains 3102 pence, for the gain upon it. Hence 182000 : 3102 :: 100 : 1·7044 the gain per cent. in 2 months, which multiplied by $\underline{\qquad 6\qquad}$

gives - - - - - - - - 10·2264 the gain per cent. per annum, which is at the rate of 10l. 4s. 6$\frac{1}{4}$d. per 100l.

N. B. This question was first proposed by Mr Clare, in his Introduction to Trade and Business, from whence it has been taken by Messrs. Birks and Vyse, and placed in their Arithmetics, but both of them have given false answers to it.

This question was also answered by Mess. James Adams, Amicus, B. Benson, John Birch, George Brown, A. Buchanan jun., John Burrow, Rd. Cockrel, Jos. Cowing, John Craggs, J. Elliott, Tho. Elmer, Matt. Fleck, John Griffith, James Hannah, John Haycock, John Jackson, Da. Kinnekrook jun., Tho. Leybourn, J. Lowdy, Tho. Metcalfe, Tho. Milner, Cuth. Naizby, Peter Nicholson, Parish Clerk of Hessle, Wm. Pearson, Philalethes Cleasbyensis, Alex. Rowe, John Ryley, I. Saul, Jos. Slack, Geo. Stevenson, Wm. Thomson, Wm. Welch, R. G. West, Tho. White, and S. Woolcott.

III QUESTION 895 *answered by Mr Matt. Fleck, of Stella.*

Put $\frac{1}{2}x^2$ for the sum the merchant began with. Then, by the quest. x^2 is the amount at the end of the 3d year, and $x + 10$ is the gain the 4th year, therefore $x^2 + x + 10$ is the amount at the end of the 4th year, consequently $\overline{x^2 + x + 10}\big)^2 = 62500$ the amount at the end of 7 years. Hence $x^2 + x + 10 = \sqrt{62500} = 250$, and consequ. $x = 15$. Then $\frac{1}{2}x^2 = 112\frac{1}{2}$ or 112l. 10s. the sum at beginning.

IV QUESTION 896 *answered by Mancuniensis.*

Let A B E D be the conical vessel, and D C E the immersed cone, of the same height and base.

Then $\sqrt{\dfrac{2827\cdot44}{\cdot7854}} = 60 = $ A B; and, per page 182 Dr. Hutton's Mensuration, 2d edit., $\dfrac{2827\cdot44\times2}{3\cdot1416\times DE} = 45 = $ D C; also $\sqrt{DC^2 - DF^2} = CF = 40\cdot31129$ nearly; but, by page 185 of the same, $\dfrac{AB^3 - DE^3}{AB - DE} \times \dfrac{\cdot7854\times CF}{282\times3}$ $= 284\cdot42045$ the content of the vessel in ale gallons; and $\dfrac{\cdot7854\times CF\times DE^2}{282\times3} = 59\cdot877989$ ale gallons, the content of the cone D C E, or the quantity overflowed by immersing it.

The ſame by Mr. Wm. Slatter, at Adderbury School.

Firſt, the ſurface of the cone divided by half the circumference of the baſe, will give the ſlant height, that is $\frac{2827\cdot44}{3\cdot1416\times20}=45=DC$; and hence $\sqrt{DC^2-DF^2}=\sqrt{45^2-20^2}=40\cdot311288=CF$ the height of the cone, or of the veſſel. Then, by page 188 of Hutton's * Menſuration, new edition, $\overline{2827\cdot44+40^2\times\cdot7854+}$ $\sqrt{2827\cdot44\times40^2\times\cdot7854}\times\frac{40\cdot311288}{3}=30206\cdot5635$, the content of the veſſel in inches, which divided by 282, gives $284\cdot42$ ale gallons.

Alſo $40^2\times\cdot7854\times\frac{40\cdot311288}{3}=16885\cdot59231744$ the content of the cone in inches, which divided by 282 gives $59\cdot878$ ale gallons; and ſo much of the liquor will overflow by the immerſion of the cone.

* Lately publiſhed in one large vol. 8vo. with great additions and alterations.

V QUESTION 897 anſwered by Mr S. Woolcott, of South Moulton.

Put v for the velocity of A before the ſtroke. Then will $\frac{A-B}{A+B}v$ be its velocity after the ſtroke, which by the queſtion is $=\frac{4}{5}v$; therefore $\frac{A-B}{A+B}=\frac{4}{5}$, or $A+B:A-B::5:4$, and by adding and ſubſtracting $2A:2B::5+4:5-4$, or $A:B::9:1$, the ratio required.

REMARK. Had the bodies been non-elaſtic, it would have been $\frac{Av}{A+B}=\frac{4}{5}v$, or $A+B:A::5:4$, or $A:B::4:1$, the ratio in this caſe.

The ſame by Mr John Dalton, of Kendal.

The bodies being ſuppoſed perfectly elaſtic, they will recede from each other after the impulſe with the ſame velocity as they approached before it, that is with the velocity of the body A. Let this velocity be called a; then the motion of A before the impulſe is aA; and ts motion after the ſame, by the queſtion, is $\frac{4}{5}aA$; therefore the motion of the body B after the impulſe is $\frac{1}{5}aA$; becauſe action and reaction are equal; but the velocities, by Mechanics, is equal to the motions divided by the maſſes or bodies; that is $\frac{4}{5}a$ for the body A, and $\frac{aA}{5B}$ for the body B; and the difference of theſe velocities muſt be

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equal to the first velocity of A, that is $\frac{a\,A}{5\,B} - \frac{4}{5}a = a$; and hence $\frac{1}{5}A - \frac{4}{5}B = B$, or $A = 9B$; so that A is to B as 9 to 1, as required.

VI Question 898 *answered by Mr James Hannah, of Broughton.*

Let A E F B be the zone or frustum, and A H I B its circumscribing cylinder. Put $x =$ A o the radius of the sphere, $y = $ A H $=$ G o the common height of the frustum and cylinder, $s = $ 1600 the curve surface, and $d = $ 1800 the difference between the solid contents, also $a = $ 3·1416. Now $x^2 - y^2 = $ E G^2 the square of the radius of the top ; hence, by prob. 17, pa. 209, Hutton's Mensuration, 2d edit., $\overline{x^2 + x^2 - y^2 + \frac{1}{3}y^2} \times \frac{1}{2}ay$ or $ax^2y - \frac{1}{3}ay^3$ is the solidity of the frustum or zone, and ax^2y that of the cylinder ; therefore their dif. or $\frac{1}{3}ay^3 = d$ the dif. of the solidities ; and hence $y^3 = \frac{3d}{a}$, and $y = \sqrt[3]{\frac{3d}{a}} = \sqrt[3]{\frac{5400}{3\cdot1416}} = $ 11·9788 the height of the solids.
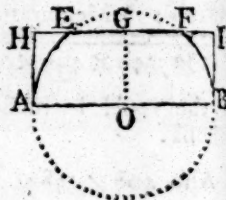
Again, by pa. 197 Mensuration, $2axy = s$ the surface ; therefore $x = \frac{s}{2ay} = \frac{1600}{75\cdot2652} = $ 21·258162 the radius, and its double or 42·516324 is the diameter sought.

And nearly in the same manner is the solution given by Messrs. Amicus, Jos. Cowing, John Ryley, Isaac Saul, and A. Whitehouse.—Many other correspondents sent solutions, which were erroneous, by having mistaken the meaning of the question, some taking a segment, others a middle zone or double frustum, and others again taking the cylinder upon the smaller end of the frustum, &c.

VII Question 899 *answered by Mr Alexander Rowe, of Reginnis.*

The number of different ways that 5 things, with 2 faces each, can come up in one throw, is 2^5, or 32 ways, out of which there are 2 ways for all heads or all tails, and 30 for the contrary ; theref. the probability of throwing all heads or all tails, in one throw, is $\frac{2}{32}$ or $\frac{1}{16}$, and the probability of the contrary, or missing them both, is $\frac{30}{32}$ or $\frac{15}{16}$; and consequently the probability of missing them 4 times running is $\frac{15^4}{16^4}$ or $\frac{50625}{65536}$; and taking this from 1, the remainder $\frac{14911}{65536}$ is the probability that the event will happen at least once in

4 throws. Whence the former probability is to the latter, as 50625 to 14911, or nearly as 3·3952 to 1, inftead of 10½ to 1, as ftaked by A. And to find the fum or value of his difadvantage, take the $\frac{50625}{65536}$ part of the whole ftake 5 l. 15 s. which is 4 l. 8 s. 1 c d. the the value of A's chance of the ftake, being 16 s. 2 d. lefs than he depofits, and therefore his difadvantage is 16 s. 2 d. on every ftake.

The fame by Mr John Griffith, of Sandbach.

The number of combinations with 5 halfpence, is 25 or 32; the number of chances for bringing 5 heads, or 5 tails, is 2; and the number for failing, 30. Whence the probability of not bringing 5 heads, or 5 tails, at leaft once in 4 throws, is $\frac{30^4}{32^4}$ or $\frac{810000}{1048576}$. Therefore as 238576 to 810000 :: 10 s. : 34 s. nearly, inftead of 10 to 105 which A depofited.

VIII Question 900 anfwered by Mr Thomas Leybourn, of North Shields.

Let A B C D be the given fquare, and A G M D the half of it, or A G K E one-fourth of it. Now it is eafy to conftruct the figure nearly by the eye, for it is only to make the fmall fegment H I K equal to the fmall external triline al F G H; for then the mixed area A F H I E will be equal to the fmall fquare A G K E. Now by the firft meafurement it is found that the radius E I is equal to 7 very nearly. Then to compute the fmall fegment H I K or its equal A O F; the verfed fine I K = 1, to the diameter 14; then by the large table of circular fegments at the end of Hutton's Menfuration, the femi-fegment A O F is eafily found to be 2·44028, which taken from the area of the quadrant E O I or 38·4846, leaves 36·0443 nearly for the area A F H I E, which ought to be juft 36, therefore the error is ·0443 too much.
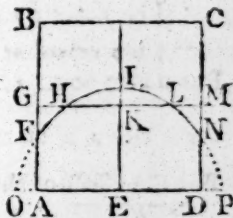
Take again, therefore, the radius a little lefs; as fuppofe E O or E I = 6·9; then to this radius, and the verfed fine A O or I K = 0·9, by the fame table, the femifeg. A O F is 2·0736, which taken from the quadrant E O I or 37·3929, leaves 35·3193, which ought to be 36, theref. the error is ·6807 too fmall. Hence by the rule of Double Pofition the radius is found to be nearly 6·9939, the anfwer.

The fame by Mr Wm. Pearfon, of North Shields.

The fquare and circle being drawn as above, put the fide A D = 12 = a, ·7854 = c, and the verfed fine A O or I K = v. Then a + 2 v is the diameter O P, and $\overline{a + 2v}^2 \times \frac{1}{2} c$ the area of the femi-circle O I P, which is equal to half the fquare plus the fegment H I L. Then, by Hutton's Menfuration, (rule 5, page 105 firft edit., or

rule 6, page 140, 2d edit.), the segment $HIL = \frac{4}{3} v \sqrt{av - \frac{3}{5} v^2}$; and hence arises this equation $\frac{8}{3} v \sqrt{av - \frac{3}{5} v^2} + a^2 = \overline{a + 2v}^2 c$; from which by Trial and Error, or otherwise, is found $v = \cdot9943$; an; hence $\frac{1}{2} a + v = 6 \cdot 9943$ is the radius of the circle nearly.

IX QUESTION 901 *answered by Mr James Ashton, of Harrington School.*

By the principles of Mechanics, the effect of the power acting at c, to break the tree at B, is directly as the length of the lever BC; and, when acting in the direction AC, it is also directly as the sine of the angle of direction c, or as the distance AB, since the hypothenuse AC is given $= 70$; hence the effect will be as the rectangle of the two AB $\times$ BC, which in this case must be a maximum, and will therefore happen when the two are equal, that is AB $=$ BC, and consequently the angles A and c each half a right angle. Hence $BC^2 = \frac{1}{2} AC^2$, and $BC = AC \sqrt{\frac{1}{2}}$ $= 49\frac{1}{2}$ feet nearly.
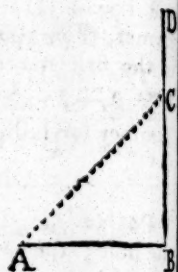
The same by Mr A. Buchanan, jun., of Sedgefield.

Let BD represent the tree, and AC the rope in its required position. Put $BD = 60 = a$, $AC = 70 = c$, and the height required $BC = x$; then will AB be $= \sqrt{c^2 - x^2}$, and sine of $\angle c = \dfrac{\sqrt{c^2 - x^2}}{c}$. But the effect of the force or rope AC is as BC $\times$ sine $\angle c$, therefore $x \sqrt{c^2 - x^2}$ must be a maximum, or $c^2 x^2 - x^4$ a maximum; then its fluxion $2 c^2 x \dot{x} - 4 x^3 \dot{x} = 0$, or $c^2 = 2 x^2$, and $\dot{x} = c \sqrt{\frac{1}{2}} =$ 49·497 feet nearly, the height sought. Hence also the distance AB is $=$ the height BC.

X. QUESTION 902 *answered by Mr J. Hartley, of Fleet-street.*

Make $a = 864$, $b = 576$, $x =$ sum of the two digits, and $y =$ side of the block. Then $6y^2$ is the superficies, and y^3 the solidity of the block. Hence, by the question $y^3 = bx^2$, and $6y^2 = ax$, or $36y^4 = a^2 x^2$. Hence $a^2 b x^2 = 36 b y^4 = a^2 y^3$, or $36 by = a^2$, and $y = \dfrac{a^2}{36 b} = 36$, the side of the cube sought.

The same by Mr Isaac Saul, of Holland, near Wigan.

Put x and y for the two digits. Then $x + y$ is their sum, and $10 x + y$ the side of the cube. Hence, by the question, $\overline{10 x + y}$ $\times 6 = \overline{x + y} \times 864$, or $\overline{10 x + y}^2 = \overline{x + y} \times 144$, and $\overline{10 x + y}^3 = \overline{x + y}^2 \times 576$. From the 1st eq. $\overline{x + y}^2 = \dfrac{\overline{10 x + y}^4}{144^2} = \dfrac{\overline{10 + x}}{24^2}$

from the 2d; hence $10x + y = \frac{144^2}{24^2} = 6^2 = 36$ the required side of the cube.

The same by Mr Wm. Weatherill, of York.

Let the two digits be denoted by x and y; so will $10x + y$ be the side of the block. Then, per quest. $\overline{10x+y}|^2 \times 6 = \overline{x+y} \times 864$, and $\overline{10x+y}|^3 = \overline{x+y}|^2 \times 576$. Divide 6 times the latter eq. by the former, then $10x + y = 4x + 4y$, and hence $y = 2x$; this substituted in the first makes it $144x^2 = 3x \times 144$, which divided by $144x$, gives $x = 3$. Consequently $y = 6$, and the side of the block is 36.

XI QUESTION 903 answered by the Rev. Mr J. Hellins.

Put $32\frac{1}{6} = f$, and $x =$ any variable height above the bottom of the hole; then will the velocity, per second, of the issuing water, at that depth, be $\sqrt{2f \cdot 1 - x}$; at which the width of the orifice will be $2\sqrt{x - xx}$. Therefore $2\dot{x}\sqrt{x - xx} \cdot \sqrt{2f \cdot 1 - x}$ or $\sqrt{8f} \cdot x^{\frac{1}{2}}\dot{x} - x^{\frac{3}{2}}\dot{x}$ is the fluxion of the quantity of water that flows out of the lower *segment* of the aperture in the first; the fluent of which is $\sqrt{8f} \cdot \frac{2}{3}x^{\frac{3}{2}} - \frac{2}{5}x^{\frac{5}{2}}$ or $\frac{10x - 6xx}{15}\sqrt{8fx}$; which, when $x = 1$, becomes $\frac{4}{15}\sqrt{fx} = \frac{8}{15}\sqrt{64\frac{1}{3}} = 4\cdot2777634$ cubical feet; and this number multiplied by 3600, the seconds in an hour, gives 15400 cubical feet nearly, the quantity sought.

N. B. This solution is on the supposition that the velocity of the issuing water, at any depth, is equal to that acquired by a heavy body in falling through that space; and if the number here given be diminished in the ratio of $\sqrt{2}$ to 1, the result will give the quantity that would run out in one hour, if the velocity be every where equal to that which is due to half the height.

The same by Mr John Dalton, of Kendal.

Let AB represent the diameter of the hole, perpendicular to the horizon, $= 1$ foot, and CD an ordinate to it; put 3600 seconds $= t$, $s = 32\frac{1}{6}$, and $AC = x$, and suppose CD to flow from B towards A. Then, by Hydrostatics, $\sqrt{s.AC.2AC.CB}$ drawn into the fluxion of AC $=$ the fluxion of the water $= \sqrt{s.2\sqrt{1-x} \cdot x\dot{x}}$; and its correct fluent multiplied by t, is $\frac{8}{15}t\sqrt{s}\times(1-\overline{1-x}|^{\frac{3}{2}}\times\overline{1+\frac{3}{2}x})$. Wherefore when $x = 0$, the fluent becomes $\frac{8}{15}t\sqrt{s} = 10889\cdot4$ cubical feet.

Note, This folution is on the fuppofition that the velocity is equal to that generated by gravity through half the height.

COROL. Hence it appears that the water flowing out of a circular hole, is to that flowing out of a fquare one, whofe fide is equal to the circle's diameter, in this circumftance as 4 to 5.

The fame anfwered by *Wirkfworthienfis.*

Put $a = 12$ inches the diameter of the orifice, $b = 32\frac{1}{6}$ feet $= 386$ inches the force of gravity per fecond, and $x =$ any variable part of the diam. from the top. Now admitting the velocity of the water at x depth to be equal to the velocity of a heavy body acquired in falling through the fame fpace; then $\sqrt{\frac{1}{2}b} : \sqrt{x} :: b : \sqrt{2bx} =$ velocity per fecond of any part of the ordinate correfponding to the depth x; and the quantity flowing out, as the velocity and aperture, or $2\dot{x}$ $\sqrt{2bx} . \sqrt{ax - x^2} = 2\sqrt{2b} \cdot x\dot{x}\sqrt{a - x}$; the correct fluent of which is $\frac{8}{15}\sqrt{2a^5b} - \sqrt{8b} \times \overline{a - x}|^{\frac{3}{2}} \times \frac{4}{15} . a + \frac{3}{2}x$, which when x is equal to the diameter of the circle becomes $\frac{8}{15}\sqrt{2a^5b} = 7391'975$ cubic inches in one fecond; whence 15400 cubic feet of water will flow through the whole in one hour,

If the velocity of water iffuing through an orifice be fuppofed equal to that acquired by a heavy body in defcending through half the diftance from the furface, as per prop. 2, book ii. of Sir I. Newton's Principia, then proceeding as before 10389 cubic feet will be found to iffue through in an hour.

XII QUESTION 904 *anfwered by Amicus.*

In the equation $x^3 - 15x = 3$, or generally, in $x^3 - qx = r$, where q and r are integers, let $x = \frac{r}{p}$, then $\frac{r^3}{p^3} - \frac{qr}{p} = r$, and $\frac{r^2}{p^2} - p = q$, where if r and q be integers, and $\frac{r}{p}$ rational, $\pm p$ if rational muft alfo be an integer. For, fuppofe the contrary, and that p is a fraction $= \pm \frac{m}{n}$ in its loweft terms, or m and n prime to each other, then $\frac{r^2n^2}{m^2} \mp \frac{m}{n} = q$, and $r^2n^2 \mp \frac{mm^2}{n} = m^2q$ a rational integer; but n, being prime to m, muft by Euclid vii, 27, be alfo prime to m^2, therefore $\frac{mm^2}{n}$ muft be a fraction, therefore r^2n^2 cannot be an integer, but it is neceffarily an integer, confequently $\pm \frac{m}{n} = p$ muft be an integ. And in the cafe in hand $r^2 = 9$, $q = 15$, and $\frac{9}{p^2} - p = 15$, and p an integer, alfo p^2 a divifor of 9 and p of 3, confequently p muft either be equal to ± 1 or ± 3; but none of the four will anfwer,

therefore $x^3 - 15x = 3$ has no rational root; and the aſſertion of *Caſtilioneus* is not true.

Scholium. By the above operation, ſimple as it is, may always be known, whether the cube root of any binomial ſurd, poſſible or impoſſible, can be extracted or not, and the trouble of ſuch extraction avoided when it is only to find the roots of an equation; ſuch, for example, as $x^3 - 15x = 4$, where, by *Cardan*'s rule $x = \sqrt[3]{2 + 11\sqrt{-1}} + \sqrt[3]{2 - 11\sqrt{-1}}$, but $\frac{16}{p^2} - p = 15$, conſequently $p = 1$ and $x = 4$. It moreover hence appears, that the objections made by Dr. Saunderſon, M. de Moivre, and many others, to Dr. Wallis's rule for extracting the root of an impoſſible binomial are without foundation, ſince that rule will always find the root when there is ſuch an one, and that may always be known from what is done above. The Doctor is alſo right in aſſerting, that, ſtrictly ſpeaking, there is no ſuch thing as an *irreducibl caſe*, or one that *Cardan*'s rule will not reach; for that rule is general for all, and when any root is rational it may always be found by the method above, and when none can be found thus, it is alſo above demonſtrated that the equation has none; and then in all caſes equally the root may be approximated by extracting the cube roots of the binomials in ſeries, as is largely ſhewn by *Dr Hutton* in the Philoſophical Tranſactions. And the method which I have given above is general for all, not only when q and r are integers, but alſo when they are rational fractions, for ſuch equation may always be transformed to one wherein they are integers.

XIII Question 905 *anſwered by the Propoſer* Amicus.

Let F G H be the equilateral triangle circumſcribing the given circle whoſe radius is $AO = 1$; let fall the perp. H A, draw A B parallel to G H, produce it till $BC = AB$, draw F C and H C. Then, from what is done for the parabola, at page 37 Diary 1788, the ellipſis muſt touch G F at A, and F C at C (becauſe $AB = BC$), and ſince $AO = 1$, $FO = 2$, $AH = 3$, and $AF = CH = \sqrt{3}$. But, becauſe $AB = BC = BF$, the angle A F C is right; conſequently A D C H is a quadrant of the ellipſis, $CH = \sqrt{3} =$ the ſemiconjugate, and $AH = 3$ is the ſemitranſverſe axis. And becauſe the radius of curvature of the ellipſis at A is a third proportional to A H. C H, and $= 1 = AO$ the radius of the given circle, that circle may be cut from the ellipſis. Had the radius of curvature been leſs, the circle could not have been cut from ſuch a curve, becauſe in that part it muſt have fallen without it.
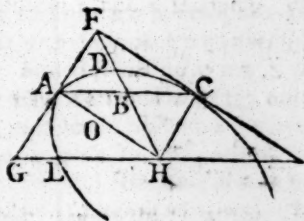
XIV QUESTION 906 *answered by the Propofer Mr Ifaac Dalby, of London.*
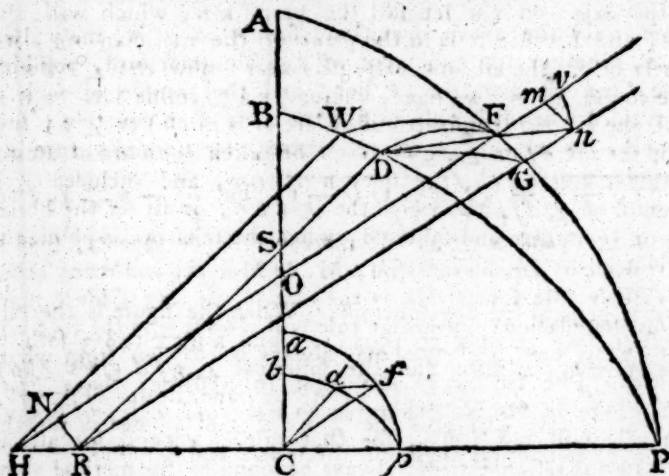
Suppofe c to be the centre; c A, c P the equatorial and polar femidiameters of the earth; P A, P B two meridians on the fpheroid; and *pa*, *pb* two correfponding ones on a fphere having the fame centre c. Let the points D, F, *d*, *f* have the fame latitudes and dif. of longitude on both figures; and draw the verticals D R, F H. Then fince the angles D S B, F O A in the fperiod are ═ the latitudes of D and F refpectively, and ═ the angles *dc b*, *fc a* in the fphere, therefore the verticals D R, F H are ∥ to the radii *d c*, *f c*. Now fuppofe the lat. of F or *f* to be greater than that of D or *d*, and let it be required to make the horizontal ∠ P D G on the fpheroid ═ the horizontal ∠ *pdf* on the fphere. Becaufe the horizontal ∠ *pdf* is meafured by the inclination of the planes *f d* c, *pd* c, and c *d*, R D are parallel, and in the fame plane, therefore where the horizontal ∠ P D G is ═ *pdf*, the plane G D R muft be parallel to the plane *f d* c; hence, if R G be drawn ∥ c *f* it will give the point G in the meridian P F making the ∠ P D G on the fpheroid ═ *pdf* on the fphere. And for the fame reafon, if H W is drawn ∥ R D or c *d*, the plane F W H will be ∥ to the plane G D R or *f d* c, and the ∠ P F W ═ ∠ *pfd*. Hence it is evident, if D be the place of obfervation, and F an object on another meridian, that the horizontal ∠ P D F between the north part of the meridian and F, will be greater (by the ∠ F D G) than it would be on a fphere, (the latitudes and longitudes being the fame on both) as long as the lat. of F is greater than that of D; for when the latitudes are the fame, the planes D G R, F W H will coincide, and the angles be the fame as on a fphere: but if the lat. of the place of obfervation (F) is the greatest, the obferved ∠ P F D will be lefs by the ∠ W F D, which, becaufe the planes H W F, R D G are parallel, is ═ the ∠ G D F the excefs on the other fide. Hence, when the fpecies of fpheroid is given, the method of determining the ∠ F D G may be thus: In the fpherical △ *d p f*, with the co-latitudes *p d*, *p f*, and included ∠, or

dif. of long. find the $\angle$s at f and d, and the side df, or $\angle\,d\,c\,f$; then from the nature of the spheroid, find the length of the vertical D R, and also R H the distance between the points where the verticals meet the axis: on F H let fall the perp. R N, which will also be $\perp$ R G, and because it is in the plane of the meridian F P, it will evidently be $=$ the arc G F extremely near: now the $\angle$ F H R being $=$ the co-lat. of F, we have, radius : H R $::$ cosine lat. : R N; and because the arc D G (considered as an arc of a circle) or $\angle$ D R G is the same as the arc df or $\angle\,d\,c\,f$, if G F be taken as an arc of a circle to the same radius (D R), the sides D G, G F, and included $\angle$ D G F ($=$ comp. of $\angle\,dfp$) will give the $\angle$ F D G, or dif. of the horizontal angles on the sphere and spheroid, when the telescope is pointed to the surface at F.

This is general for any spheroid. When the figure is the ellipsoid in question, we get D R $=$ 3508112, and R H $=$ 148·3 fath. hence R N (G F) $=$ 95·3 fath. and the spherical $\triangle\,pfd$ gives $\angle\,pfd =$ 135° 45′ 16″·2, $\angle\,pdf =$ 43° 51′ 18″·2, and the arc $df =$ 27′ 49″·7 $= \angle$ D R G; this will give the $\angle$ F D G $=$ 8′ 5″ nearly for the dif. between the horizontal angles on the sphere and spheroid.

But when the telescope is horizontal, the dif. will evidently be something less: Let m and n be the points where the vertical (or flagstaff) Hm, and its parallel Rn, cut the plane of the horizon of D; then mn (in the plane of the meridian P F) will be what subtends the true difference, which may be determined as follows: Seeing Dn (which is a perp. to the vertical D R, or the tangent to the $\angle$ D Rn, D R being the rad.) and the tangent to the meridian at D are both in the plane of the horizon, conceive the tangent of the co-lat. of D to be drawn to meet the axis C P (produced) then rad. : D R $::$ tang. co-lat. (40° 20′ $= \angle$ D R P) : 2978606 fath. $=$ the tang.; and rad. : D R $::$ tang. D R G (27′ 49″·7) : 28398·5 fath. $=$ Dn, this, and 2978606 the other tang. and the included angle 43° 51′ 48″·2 ($\angle$ G D P or n D P) as a plane triangle, gives the $\angle$ at $n =$ 135° 45′ 19″·6, and its comp. 44° 14′ 40″·4 is $=$ the $\angle$ m n D. Now suppose R to be the vertex, Rn the axis, and n D the radius of the base of a cone whose base is in the plane of the horizon; then if $a =$ sine of 44° 14′ 40″·4 (mnD), and $s =$ sine 67° 52′ 39″·8 (half its comp.), $l =$ D R, and $m =$ Dn (the radius of the base) it will readily be seen that

$$\sqrt{l^2 + \frac{a^2 m^2}{s^2}} = 3508177\cdot8 \text{ fath.}$$ is the length of a line drawn from

R to meet mn (produced) in the circumf. of the base; this line, the axis R$n =$ 3508227·2 fath. and 28398·5 (the rad. of the base) being the sides of a plane triangle in the plane of the meridian A P, will give the $\angle$ m n R $=$ 89° 40′ 6″·3; hence the $\angle$ m n v ($n$$v$ being $\parallel$ R N) $=$ 19′ 53″·7, and $m$$v$ being $=$ 95·3 fath. $=$ R N, we have $n$$m =$ 95·35 fath. nearly; this, with D$n =$ 28398·5, and the included $\angle$ m n D $=$ 44° 14′ 40″·4. gives the $\angle$ n D $m =$ 8′ 4″·4 the difference of the horizontal angles; hence the observed $\angle$ at D $=$ 43° 51′ 48″·2 $+$ 8′ 4″·4 $=$ 43° 59′ 52″·6.
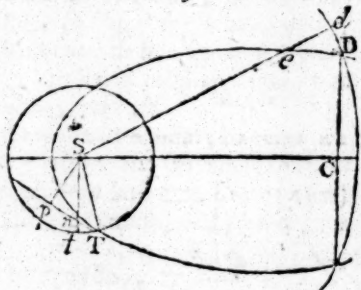
XV or Prize Question *answered by Amicus.*

According to the method made use of by *Sir I. Newton* for determining the heat of the Comet of 1680, the heat at that in question will be to the heat of the summer sun here as 4·9741 to 1, or nearly as 5 to 1; and generally at the distance y from the sun, the heat will be as y^{-2}, and if $z =$ the arc or angle to a given radius 1, described by the comet about the sun in the time t, $y^{-2}\dot{t}$ will be as the heat received in the time t; but $\dot{t}$ is as the elementary area described about the sun in that time, that is $\dot{t}$ is as $\frac{1}{2}y^2\dot{z}$, consequently the heat in the time t will be as $y^{-2}\frac{1}{2}y^2\dot{z}$ or as $\dot{z}$, and in the finite time t as z the angle described about the sun in that time, let the distance be what it will. Which conclusion, though differently brought out, is agreeable to that of Mr Simpson at Art. 473 of his Fluxions. Hence then, whilst the comet in any part of its orbit describes an angle $= \frac{180°}{64\frac{1}{8}}$, it receives at the point turned towards the sun a quantity of heat equal to that received at a like point of the earth during the course of a year. Because the earth must make $128\frac{1}{4}$ revolutions to receive the quantity of heat which the comet does in one of its revolutions, therefore in one year the earth can only receive the $\frac{1}{128\frac{1}{4}}$ of this, or a quantity $=$ that received by the comet during the time of describing an angle about the sun $= \frac{360}{128\frac{1}{4}} = 2° \ 48'.42$; and the time which the comet in different parts of its orbit takes to describe this angle, is given by *Kepler's* problem.

The same answered by Mr John Dalton, of Kendal.

Lemma 1. Suppose two like bodies to revolve round the sun in concentric circles; then the quantities of heat received by each body in one revolution will be inversely as the square root of their distances from the sun. For let H, h be the quantities received in any small given time, as one second; T, t the periodic times in seconds; R, r their distances from the sun. Then as the density, and conseq. the heat of the solar rays, is inversely as the square of the distances from the sun, it will be $H : h :: r^2 : R^2$, and it is well known that $T : t :: R^{\frac{3}{2}} : r^{\frac{3}{2}}$, theref. by multiplication $TH : th :: \sqrt{r} : \sqrt{R}$.

Lemma 2. Suppose two like bodies to revolve round the sun, the one in a circle and the other in an ellipse whose transverse is equal to the diameter of the circle; then the quantities of heat received by each in one revolution will be inversely as the areas of their orbits. For let the orbits be as in the figure, and draw S D, and S *ed* indefinitely near

it; then since the velocities of the two bodies when at D are equal (Principia lib. i. prop. 16, cor. 4), the times of describing, and consequently the heat acquired in Dd, De, will be as Dd to De, that is, from sim. $\triangle s$, as $Dc : sD$, or as the area of the ellipse to the area of the circle. But (Simpson's Flux. art. 473) the whole quantities received in one revolution are as the quantities received in the $\angle Dsd$; therefore the truth of the lemma is manifest.

Solution. To determine the comet's orbit, from the data and the laws of centripetal forces, it will be $1^2 : 13 :: 128\frac{3}{4}^2$: the cube of the semitransverse of its orbit; which by extracting the root is had $= 25\cdot4314769 = a$, and the eccentricity $=$ semitransverse — perihelion dist. $= 24\cdot9829669 = b$; from which (47 Eucl. i.) the semiconjugate is had $= 4\cdot755142 = c$. Then from the first lemma it will be $\sqrt{a} : \sqrt{1} :: sq : \dfrac{sq}{\sqrt{a}} =$ the heat that would be received by the comet in one revolution round the sun in a circle, whose diameter $=$ the transverse of its orbit, where s denotes the number of seconds in 1 year. But by the 2d lemma, $c : a :: \dfrac{sq}{\sqrt{a}} : \dfrac{sq\sqrt{a}}{c} =$ the heat received by the comet in one revolution in its proper orbit; half of which $= 16735512 q =$ the quantity of heat received in its passage from aphelion to perihelion, as required. Also, the heat of the comet in perihelion will be to the mean heat of the earth, as 1 to $\cdot44851^2$, or as $4\cdot97113$ to 1 nearly.

Otherwise thus, without the Lemmas.

The dimensions of the orbit being found as above, and the notation retained, half the latus rectum $= \dfrac{c^2}{a}$. Draw sT to the intersection of the orbits of the earth and comet (which orbits may be supposed in the same plane, without error in this consideration); also draw a tangent to the point T of the ellipse, and sp perp. thereto; which last will be (Emerf. Conics, prop. 24) $= \dfrac{c}{\sqrt{2a-1}}$. Let Tn be the small part of the comet's orbit run through in a second at that place, and draw snt to cross its orbit in n and meet the earth's orbit in t; then the triangles spT and Ttn being similar, $Tt : Tn :: sp$ $\left(\dfrac{c}{\sqrt{2a-1}}\right) : Ts (1)$. But the velocity of the comet at the point T is to the velocity of a body revolving in a circle at that distance from the sun (Principia, lib. i. prop. 16, cor. 9) as $\sqrt{sT \times \frac{1}{2}\text{ lat. rect.}}$ is to sp, that is as $\dfrac{c}{\sqrt{a}}$ to $\dfrac{c}{\sqrt{2a-1}}$, or as $\sqrt{2a-1}$ to $\sqrt{a}$; and the times being as the spaces directly and velocities inversely, it will be, as time in Tt: time in $Tn :: \dfrac{c}{\sqrt{2a-1}\cdot\sqrt{a}} : \dfrac{1}{\sqrt{2a-1}} :: \dfrac{c}{\sqrt{a}} : 1 ::$ the

heat received in τt: the heat received in τn (the body being given); and as this ratio likewise obtains for the whole quantity of heat received by any given body in one revolution in each orbit (see Simpson above) and the whole quantity received in one revolution in the earth's orbit being $= sq$, it follows that $\frac{c}{\sqrt{a}} : 1 :: sq : \frac{sq}{c}\sqrt{a} =$ the heat received by the comet in one revolution as above.

N. B. Other answers to the questions, &c. with a variety of new matter, may be seen in the Diary Companion or Supplement, containing the same quantity as the Diary, and paged and numbered properly as a continuation of it, price only 6 d.

New Questions.

I Question 908, *by Mr A. Buchanan, jun. of Sedgefield.*

From these equations here subjoin'd *
In next year s Di, pray ladies shew
My age.—With ease you'll soon it find
In years and months from what's below.

Given $x^2 y + x^3 = 7581,$ } Where x is the year,
and $x y^3 + y^2 = 513$ } and y is the month.

Question 909, *by Mr John Fildes, Schoolmaster, Liverpool.*

Being in a room opposite to the side of a window, the bottom of which was just the height of my eye, I observed that up the edge of the window I could see 42 courses of bricks in a wall on the opposite side of the street; but walking in a direct line towards the window 5 yards, I found that I could see 72 courses. Required the height of the window, supposing the breadth of the street to be 12 yards, and 4 courses of brick work to the foot in height.

III Question 910, *by Mr John Hepworth, of North-walsham Academy.*

Required the roots of the equation $4x^4 + 8x^3 - 89x^2 + 28x + 49 = 0$, by quadratics only.

IV Question 911, *by Mr John Bickford, Westminster.*

It is required to find a point in a right line between the earth and moon, from which an equal quantity of the surface of these two bodies might be seen: the earth's diameter being 7964, the moon's 2192, and the distance of their centres 240000 miles.

V Question 912, *by Mr Matt. Terry, of Askrigg.*

Suppose a semispherical vessel, whose diameter is 12 inches, be filled with water; at what distance from its edge must a person stand, the perpendicular height of whose eye above the top of the same is 4 feet, so as just to see the centre of its bottom?

VI QUESTION 913, *by Mr Thomas Crosbey, of York.*

Admit that on June the 21st the body of the sun be observed to rise out of the horizon, in 8 minutes time; what is the latitude of the place?

VII QUESTION 914, *by the Rev. Mr L. Evans.*

The counterpoise of a steelyard being lost, it was observed, that there are on one edge of the arm 53 divisions, and on the other $11\frac{1}{2}$, each exhibiting in weighing one pound avoirdupois; moreover it was found that a weight of 1 oz. 5 dts. 12 grs. placed on the last, or $11\frac{1}{2}$ division of the less scale kept the balance in equilibrio. What must be the weight of a new counterpoise?

VIII QUESTION 915, *by Mancuniensis.*

Ye British Philomaths profound,	As many times as Terra's run
Th' equation plac'd below expound;	Her annual course around the sun,
And you my age will quickly see,	Since first into this world of strife
For three times *x* exact will be	I came to drink the cup of life.

$$3x^4 + \frac{201684}{x} \text{ a minimum.}$$

IX QUESTION 916, *by Mr John Haycock, of Ware.*

Given the breadth of a river, B G;

and the length and breadth of a barge,

A C, C E; to find the least breadth of a

new cut, G H, at right angles, suf-

ficient for the barge to turn into; sup-

posing B G less than A C.
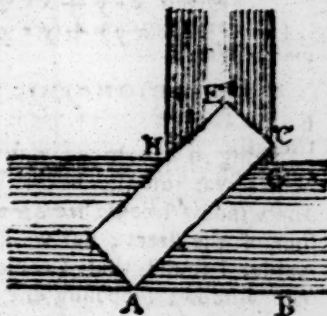
X QUESTION 917, *by the Rev. Mr Wm. Sewell, A. M. Northwalsham.*

Query, are those picture frames, we purchase of the oval-frame turners, true Apollonian ellipses, or not?

XI QUESTION 918, *by Archimedes.*

To what constant height must the weight of a pile engine be raised, so as to have the greatest effect in a given time, the time of raising the weight being always as the weight raised?

XII QUESTION 919, *by the Rev. Mr Hellins.*

Given $\dot{y} = \frac{y\dot{x}}{xx} + \frac{\dot{x}}{xx} + 3\dot{x} + 2x\dot{x} - \frac{4\dot{x}}{x}$, to find the correct fluent of $y\dot{x}$, generated while y from 0 becomes $= 44$.

N. B. The reason for reproposing this question will appear in the solution.

XIII Question 920, *by Lieut. Wm Mudge, Royal Artillery*.

If a heavy weight of iron, having a rod of 20 feet long fastened to the bottom of it, be suffered to descend from a height less than the length of the rod, the lower end of which slides freely along the ground as the weight descends; and if a small ring of metal be run on the rod, touching the weight when it first begins to descend: Query how high should the weight fall from, so that when it arrives at the ground, the ring shall have run over one fourth of the rod.

XIV Question 921, *by Mr John Bonnycastle*.

If any equation, above a simple one, have its exponents coefficients and absolute term whole numbers, neither of its roots can be expressed by means of any simple surd whatever, uncompounded with other quantities. Required the demonstration.

XV. Question 922, *by the Rev. Mr Rob. Bownas, of Bardsey*.

To determine geometrically (i e.) without the help of Algebra or Fluxions) the arc of a circle such, that the excess of any multiple of its sine above its chord, may be a maximum.

XVI Prize Question 923, *by Amicus*.

(Whoever answers before Candlemas Day, has a chance for 10 Diaries, and another for 8.)

If from any three given points lines be drawn to meet in a fourth point, so that one of them shall be always an arithmetical mean to the other two: required the vertices, asymptote and species of the curve which is the locus of this fourth point?

N. B. The Proposition from Dynamicus *came to hand too late to be inserted this year.*

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